Pit and Quarry
SAND • GRAVEL • STONE
HANDLING • CRUSHING • SCREENING • WASHING

Drilling a High Face of Almost Vertically Stratified, Seamy, Flinty Limestone

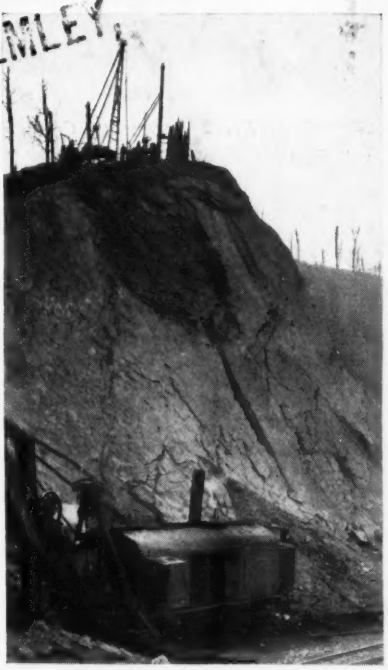
THE entire success of many a quarrying proposition hinges on the drilling of blast holes. Such was the case with an eastern Oklahoma limestone quarry.

The stratification of the rock is a few degrees from the vertical, some of the bedding planes being opened so as to form seams large enough to cause the drilling tools to drift. The rock contains just enough flint to cut gauge on the drill bit. The working face varies from 60 to 110 ft. in height.

Former snake holing had developed a constantly increasing toe, which was a handicap to shovel loading. Previous to the appearance of a Cyclone representative other makers of big blast hole drills had refused to tackle the proposition on a basis of guaranteeing a hole to the quarry floor level as desired by the operators.

The accompanying photograph was taken after a No. 14 Cyclone Drill had finished its third hole 98 feet in depth—and somewhat proud of its work. On the far side of the Cyclone is an ordinary water well drill that had been working unsuccessfully for weeks trying to put a hole down.

How and why the Cyclone Drill was able to handle this difficult drilling proposition is explained in our Blast Hole Catalog B-45. A copy of this catalog will be sent to anyone interested or engaged in quarry operations.



The Sanderson-Cyclone Drill Co., Orrville, Ohio
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November, 1921

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Circulation, 6,700 copies net

Brownhoist No. 2 Locomotive Crane on Creeper Trucks with Brownhoist Dragline Bucke

Brownhoist method is 50% cheaper

That is what the Long Island Railroad, Jamaica, Long Island, say about their Brownhoist Locomotive Crane. Their first crane was purchased in 1910. Since that time so many new jobs have been found on which a Brownhoist saves money that they are now operating four cranes.

These cranes are used mostly on construction work along the right of way. As on many other jobs, their chief economy lies in the fact that they are self-propelling units which can travel anywhere with a load. Brownhoist cranes are built with creeper trucks, traction wheels or railroad trucks. They operate by steam, electricity or gas engine.

The fact that companies similar to your own are saving money with Brownhoists makes us feel sure that you could do the same. May we send you a copy of our catalog K? It shows how many companies are cutting costs.

The Brown Hoisting Machinery Co., *Cleveland, Ohio.*

Branches: New York, Chicago, Pittsburgh, San Francisco, New Orleans.

Other Products—Buckets, Electric Hoists, Overhead Cranes, Bridge Cranes, Heavy Dock Machinery, Bins.

BROWNHOIST

MATERIAL HANDLING MACHINERY

Pit and Quarry

Member Audit Bureau of Circulations
A Monthly Journal for Producers of Sand, Gravel, Stone, Cement, Gypsum and Lime

VOL. 6 CHICAGO, ILL. NOVEMBER, 1921 NO. 2

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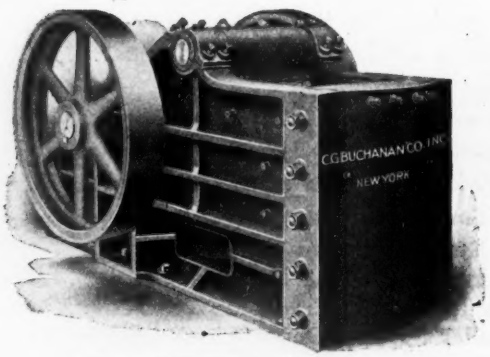


Type "C" Panel Side Frame

We have it here on our floor—just the size you need to meet your crushing requirements. And you will find the Buchanan a rugged crusher—all steel construction—with the ability to do the hardest kind of work at low cost.

Let us help you arrive at the best size and type of Buchanan Crusher for your work—36 sizes, from 66 in. by 84 in. to 5 in. by 12 in.

C. G. BUCHANAN CO., INC.

West Street Building **NEW YORK**

Pit and Quarry

Vol. 6 Chicago, Ill., November, 1921 No. 2

COME ON! IF ALL OF US LEND A HAND WE CAN PUSH IT THROUGH
HIGH FREIGHT RATES
UNITED EFFORT
Sam Merrell
Business Cartoon Service

Let's Make It Unanimous!

ORGANIZED activity is getting results in the matter of freight rates. Perhaps it is not as yet getting all that might be desired, but the gates of opposition are gradually being battered down.

The man on the outside, who has done nothing to help in the fight, will of course get the benefit along with the rest. But most pit and quarry operators are regular fellows. They do not want to be put in the class of those who are getting something for nothing.

And if it will make them feel any more conscience stricken, we might call their attention to the fact that results would have been secured much sooner if they had taken hold and helped from the beginning.

But it is not too late now. There is much to be done, not only on freight rates but many other matters of mutual interest, to justify organized effort. There always will be. A strong organization can go from conquest to conquest.

You can get the greatest benefit for yourself by helping all. An organization can be of greatest service to the industry only by having the help of all.

The convention season is coming on. Line up with your local, state and national organizations. Get out to the meetings. Pay your dues. Boost for the things the officers are trying to put over for you.

Loading Stone By Contract

AN INQUIRY came to this journal, from a reader, asking for information as to loading blasted stone at the quarry ledge into three-ton cars, by piece work, or the contract method, as it is known in some sections of the country.

It is stated that the quarry cars are almost forty inches high and are being loaded by hand on the day wage basis, which has proven both expensive and unsatisfactory. A locomotive is used to transport the cars in the quarry back and forth from the crusher. It is desired to know if any information, printed or otherwise, is available for distribution.

Unfortunately such data is meagre, as each operator believes that any information of this character is private and seldom makes it public. The writer, through serving many operators, has had the opportunity to obtain many figures on this subject. He is not at liberty to make public definite figures, or the source of the information, but he can give the readers of PITT AND QUARRY some suggestions that may be a guide to them.

First, he would warn operators that although there are many evils in day labor methods, and the contract system has some advantages over it, yet it cannot be termed a panacea for all the evils. There are bad features in the piece work or contract system that must be handled with care and at times it is difficult to hold enough men at their work to have enough stone to operate the plant. This is due to the fact that many of the men, the best workers, can make more money each day than when working for a daily wage. The result is these men may be satisfied by working only three or four days each week. If enough men lay off the entire organization is crippled.

For this reason the rate per ton must not be too high, even if a high rate allows the operator to make a good profit. The price paid must allow the average man to make more than a daily wage. More than this breeds trouble.

Then, too, if there is not some way at hand to weigh each car, disputes and troubles will arise over the amount a man has loaded. Men even learn to place stone in a car so that the car is quickly filled, yet the tonnage is not there, and thus the operator pays too large a price for the load.

If the matter is handled properly it can be stated that the contract method will give better results than doing this work by day labor.

With this method practices vary somewhat, but as a rule the rock is shot down and the men assigned to certain places in the quarry. The workmen are supposed to do their own boring down of the rock, also sledging and loading the vehicles. Boulders that cannot be sledged must be broken up with explosives. There should be a limit placed upon the blasting of boulders, otherwise the men will claim they cannot break boulders, and the saving effected by the contract method can be offset by the extra cost of explosives. For this reason a limit is placed and it is seldom practicable to allow more than two or three shots for each morning and afternoon. The operator pays the cost of explosives for this boulder breaking.

In some cases the man furnishes his own tools, such as shovel and pick, a bar, sledge and stone fork, but in most cases the operator furnishes all tools and keeps them in working condition. Better results can be obtained by this procedure as the men accomplish more work and it saves quarrels among the workmen, each man claiming the same tool.

With the contract method the men should be furnished ample cars so that they will not be idle while waiting for empties. This makes the men dissatis-

fied and there is danger of reducing the daily output of the plant.

The price per ton or car varies in different sections of the country and for different kinds of rock. The variation of the standard scale of wages also causes the price paid per ton to go up or down.

The price paid per ton will vary from 10 to 30 cents. It is hardly possible to give exact figures but in a vast majority of cases the price per ton runs from about 20 to 25 cents. Each operator must study the proposition and set his own rates. To attempt to follow some one else only comes to trouble, for conditions are seldom the same and the men's viewpoint must be considered.

Air Compressors on Shovels

IN a quarry recently visited the rock blasting was done by means of deep holes with a well driller. A small portable gasoline air compressor furnished power for two hammer drills to break up the large boulders and blast the bottom when necessary.

A revolving type of shovel was used to pick up the blasted rock and load it into cars. The large blasts made had thrown down several thousands tons ahead of the shovel. The hammer drills were working about 400 feet ahead of the shovel, when the latter uncovered a large boulder, containing 5 or 6 tons, too big for the shovel to handle and to go into the crusher.

It was necessary to stop the shovel, then stop the hammer drilling, get a gang of men to move the air compressor down near the shovel, start the drilling and break up the boulder by blasting. Thus the steam shovel was idle, the crushers were idle and most of the work stopped in the quarry.

A mistake was made in this case, for the boulder should have been broken up by adobe blast; but even this would not have been necessary if the steam shovel had had a small air compressor mounted on it. With such a machine a long hose can be used and with a small hammer drill any boulder in front of the shovel can be drilled and broken without any great delay to the shovel, saving moving other drills and machines from work they are engaged upon.

Rebuilding France

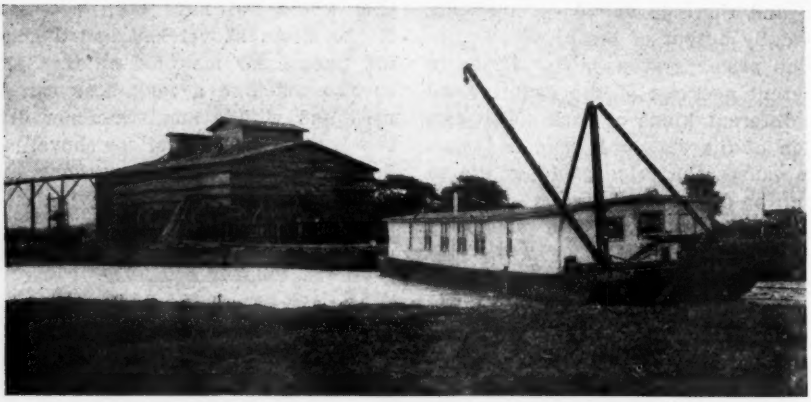
FRANCE is reported to be looking to this country for some genius of organization and construction to rebuild some of its devastated territory.

Building interests ever since the war have been speculating upon what method the French would take to rebuild devastated France. Lumped as one big construction project it at once appeared as the biggest of its kind in recent times. In fact it seemed to be such a huge undertaking that expert building authorities who had gone to France to look over the situation had returned with the opinion that it was too big an undertaking for almost any one man to handle. It seemed more likely to these contracting authorities that the work would eventually be parcelled out.

It develops, however, that the Government of France has been studying this situation ever since the signing of the Armistice and in line with its general reconstruction policy, has been working out its rebuilding problem upon a broader basis than that of immediate relief only.

Some months ago a French Commission came over and made some investigations of the American industrial system, as a result of which it is rumored that a man has been tentatively selected to do a large part of the work.

If this is true, American materials will no doubt also be used quite extensively in the work in France.



General View of Plant, Showing Dredge and Screening and Storage Building

Hahn-Muscatine Plant

New Iowa Sand and Gravel Pit Has Features That Are Interesting

This gravel plant at Muscatine, Iowa, has a number of unusual and interesting features of construction. Operations there have been going on steadily since the first of July although the plant was running a few months before that time. Certain mechanical difficulties however, prevented the realization of the highly efficient operation that the management contemplated and it was decided to shut down and remodel. The defects have been remedied and extensive alterations have been made. The plant is now running at high efficiency.

The deposit of gravel covers about 83 acres and runs to an estimated depth of 70 feet. The material is composed of about 50 per cent sand and 50 per cent gravel. The amount of clay is negligible and oversize does not exceed 1½ per cent.

One of the most notable features at the plant is the Mitchell vibratory screen made by the Stimpson Equipment Company. Two of these screens are installed in a position where the gravel will cross them after it passes the grizzly and oversize has been eliminated. The grizzly bars, spaced about 2¼ inches apart, drop the oversize to a stock pile outside the building. An occasional sale of this material for road bottoms keeps the amount on hand always small. The material then passes over the first vibratory screen which forces the screen cloth into the sand and gravel 3,600 times a minute, eliminating the water and sand. The remaining gravel passes over the second vibratory screen which makes an-

Enterior of Barge, Showing Erie Pump

other selection and passes the two grades thus obtained on to the bins. The Hahn Company has a full set of screens for all sizes from ⅛ inch to 1½ inch, and they say it is a very simple matter to change from one set to another. The ratio of water to solid material is about 8 to 1.

The sand and water which is eliminated at the first vibratory screen is taken care of by an 8 inch Amsco pump which attends to the sump operation. This operation is clearly shown in the accompanying sketch. The pump passes the sand and water to a settling tank 16 feet long and 8 feet wide which allows the water to

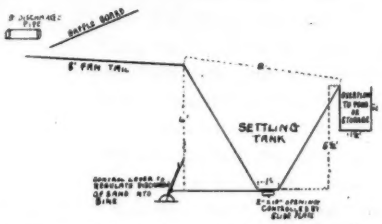


Diagram of Settling Tank Arrangement

run over an adjustable spillway. The sand settles at the bottom and is run on to the bins through a 2x10 inch opening controlled by a slide plate opened and closed by a lever. This 8 inch Amsco pump is primed by a Union pump, located close by in the washing plant.

After the gravel has been washed it is passed to the bins by a bucket conveyor made by the Hahn people of 10 inch buckets attached to rubber belting. This conveyor passes the material on to the various bins. These bins unload at the side of the building into cars or motor trucks.

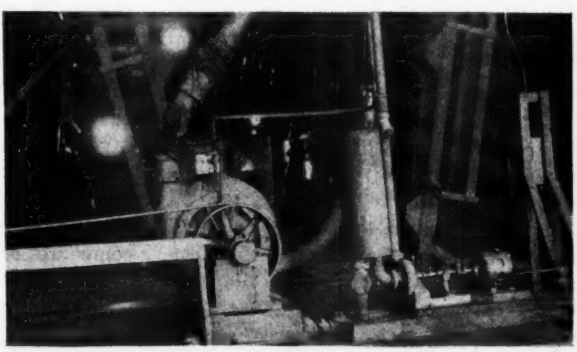
The large building shown in one of the illustrations is 126 feet

Side of Building, Showing Car-Loading Method

long and 85 feet wide. It is very substantially constructed and has ample storage space. The entire operation, with the exception of the dredging, is carried on in it. All machinery is electrically operated.

The barge is 120 feet long with a 25 foot beam. It is very well constructed, comparatively new, and was brought to the plant from the Mississippi River at the time operations were begun. It is still floating in Mississippi River water although the river itself is a good mile away. The pit is at river level and the water in it rises and falls with the rise and fall of the river.

A 12 inch Erie pump with a 14 inch discharge is used in taking out the material. This is operated by a 200 H. P. Westinghouse motor, with General Electric control. A 20 H. P. Stroudsburg Automatic hoist is used for the derrick. All the work of op-



8" Amsco Pump for the Sump Operation

erating is easily handled by one man. All the control levers, pressure and vacuum gauges, etc., are very compactly arranged and reached or seen, as required, from one position. The whole barge is very well designed, its large size permitting a compactness that does not necessitate crowding.

A small Unique pump is used for keeping the barge free from excessive bilge water. On the barge is also stored an extra centrifugal pump which can be quickly joined up in place of the one now installed.

The Hahn company reports a very busy summer season, and has been working at its capacity of 50 cars a day. Much of this work has been for state road building contracts and other public improvements.

The active head of the business is Mr. H. E. Hahn who maintains offices in Muscatine where he is interested in other enterprises. The superintendent of the plant, which is located a few miles out of the city, is Mr. E. Dierks.

What You Save by Paying

AN advertiser in PIT AND QUARRY recently printed in his ads in large black type the following words:

"It Is Not So Much What You Pay as What You Save By Paying."

The truth of such a statement has been forcibly impressed upon the writer many times when managing pits and quarries and during recent years in visiting many operations. It is a sentence that every business man could place on his desk where it can be seen every day in the year. To consider and follow it would mean to save many dollars in a year's time.

This is as true in expending small sums of money as it is with large amounts. Two partners disputed about trying a new crusher. One maintained that they could not afford to spend the money, the other argued that the machine would quickly pay for itself. The crusher was bought and installed and it was soon perceived by the increased profits made that it was not so much what you pay as what you save by paying.

This has been the case in many plants as to machines. A man lets a machine get out of order to save purchasing some new parts. Another refuses to keep his boiler tubes clean to save a few dollars and pays out hundreds of dollars in extra coal bills.

One business man was asked by his office man to expend four or five hundred dollars to purchase an adding machine and other office appliances. "No," was the word, but later the employer hired another clerk whose salary in a year was several times more than the cost of the machine desired. Later the machines were bought and the services of a clerk was saved, yet bills were going out promptly, accounts kept up to date, and the general satisfaction and saving was greater than the amount paid.

A quarryman started a new quarry and made many mistakes in buying his plant and installing it. Another man seeing this and deciding to open up another quarry employed an expert to assist in planning the plant and developing the quarry. After a few months this quarryman declared by expending a few hundred dollars in this way he had saved thousands, and had prevented mistakes that would have taken from five to ten years to learn and rectify. He was emphatic in stating that by paying what the other quarryman had refused to pay, he had saved big money.

Many examples could be given to prove these things, but sufficient have already been cited. The idea may come up in nearly every purchase made. It is a good thing to be a low buyer, but many things in this world cannot be bought on price. This is especially true about machinery.

Anchoring a Cableway in Mid-Stream

A READER writes that his company is installing a slack line cableway along a river for the purpose of taking out gravel for road construction. He wishes to know the proper kind of an anchor to use for anchoring the carrier cable in mid-stream.

As in many cases of this kind, the only information given to base a reply upon is the question as outlined above. Neither a sketch of the stream or its banks, the location of the plant, the amount of gravel to be excavated or the depth of the water, or any other important detail as to the heights of the banks, are given.

As a result the first answer that comes to mind is, "Don't anchor in mid-stream, but instead use an anchor on the opposite bank."

Should the bank be too high, cut it down to take the dead man or anchor, or if this is not necessary, sink a dead man at the water's edge to hold the cable. If these suggestions are not practical, so as to allow the bucket to go to the bottom of the stream readily, the anchor can be placed on the opposite shore and a heavy weight can be attached to the cable by means of cables or chains fastened with clips and the cable forced down into the water to give the desired digging angle.

If this is not feasible, then an anchor must be sunk in the stream, first attaching the cable to it. There are several methods of doing this, depending upon the kind of an anchor used.

One easy method is to build a raft of scantling and planks, building sides to it like a large box. The cable can be fastened around the bottom of the raft. This can be floated to place. By means of two scows one on either side it can be kept afloat by passing several ropes or hawsers under it. Then concrete can be mixed and dumped into the box on the raft. As the box is filled it will sink until the ropes prevent it from going deeper. Then the box is filled and the ropes are cut and the anchor with the cable sinks to the bottom of the river. The depth must be known so as to provide the proper length for the cable, the weight of the bucket and its load must be known to decide upon the size of the anchor. If the anchor does not hold, stone or gravel can be dumped upon it to give it greater stability.

Another kind of anchor to use is several old timbers or logs fastened together and the cable made fast around the center. These can be fastened on the bank and towed in place. Then either in boxes on each end or by attaching weights to the two ends, old iron or boulders sink it to the bottom. Then over the entire anchor rocks etc., can be dumped until there is enough weight on it to hold it to its work.

The use of these two types of anchors would mean that new anchors must be sunk for each change of the cableway. If such changes were frequent this would be expensive. If the anchor must be changed frequently, then some type of a flat scow should be used as an anchor. The cable would be fastened to heavy timbers bolted to the deck. The scow is anchored in the stream by means of cables from the opposite bank. The scow can be made more stable by using four heavy spuds, one at each corner of the scow, provided the depth of the water will admit of using spuds. Some means must also be provided for raising the spuds from the bottom. This may be done by means of a derrick, or a windlass, or even a ratchet gear worked by hand.

The methods of making an anchor here outlined are merely suggested by the inquiry. They may or may not be suited to the local conditions, but if not they may suggest some solution.

Plant of Summit Marl Co. Showing Mill and Storage Building and Cableway Mast

Work big Marl Deposit

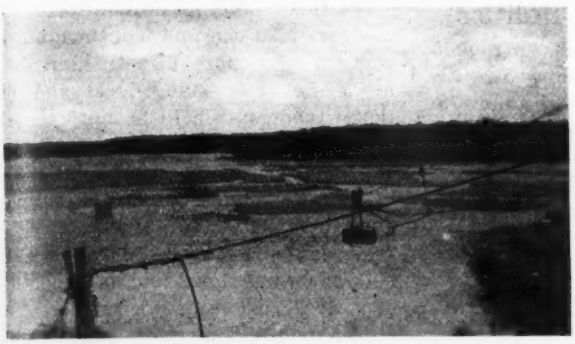
Summit Marl Co., Watertown, Wis., Produces Fine Material For Agricultural Use

AT SUMMIT CENTER, Wisconsin, the Summit Marl Company has a deposit covering some 30 acres and containing marl sufficient to insure operation of this company at the present capacity for the next 50 years. The plant has been erected very recently; in fact, there is some work still to do before operations can be begun on the large scale originally contemplated. Most of the machinery is now in place but there still remains the erection of the elevators, which the men of the company designed and will install themselves. This will be one of the big features of the plant and it is regretable that details are lacking at this time.

The deposit is entirely under water. The buildings are all erected on made land surrounded by the marshy ground which contains the marl. The work of taking out the material is handled by a Sauerman dragline.

This latter piece of equipment will bring the material to a Ruggles-Coles dryer, which will remove all moisture and put the material in the proper condition for handling by an Emerson separator. After this last operation the material is in proper condition for use. It is placed in two bins and delivery is made from these by chutes. The cableway is operated by a Lidgerwood hoist and engine. The mill machinery will be run by electric motors.

The men who are behind this project are prepared to prosecute it vigorously. They have devoted a great amount of study to the finding of markets for their product and expect that, by the time they are prepared for maximum production, the demand in the



The Marl Deposit, Showing also Sauerman Dragline Bucket

territory they serve will be sufficient for all the material they can turn out. The value of marl as a corrector of soil acidity is coming to be better understood every day in this section of Wisconsin and the Summit Marl Co., is working hard to get universal acceptance of the idea.

The officers of the concern are: President, E. F. Genrich; Vice-President, E. Weber; Secretary and Treasurer, H. R. Moldenhauer. The President, Mr. Genrich, also fills the office of Superintendent.

Re-handling Stone With Portable Belt Conveyors

THE writer of this article recently visited a quarry that produced crushed stone and did a large business in small size rough building stone. This stone was produced along with that taken out at the ledge for crushing, being placed in stock piles from which as occasion arose it was sold. During the winter when all other business in the quarry is shut down the production of the rough building stone is continued, the stock piles being increased in size each week until spring, when the sale of the building stone commences.

When the stone is sold it is loaded into trucks, the large 5-ton size, by men. As some of the stones are two-men size this loading into high truck bodies is both slow and expensive. Men must raise large stones above their heads to throw them into the trucks.

It is the same when fluxing stone is produced and stored upon the ground and then rehandled with trucks or railroad cars, or the latter are loaded by means of trucks. In most cases men handle the stone; although flux stone is not as large as building stone, yet this rehandling is expensive.

The cost of this truck, wagon, or car loading can be materially reduced by using a portable belt conveyor or wagon or car loader. It is true that this type of conveyor will not pick up stone from a pile, but men can feed the stone onto it very rapidly by hand and it will elevate the pieces and dump them into the vehicle. Two men can load onto this type of conveyor as much stone as four men could load into a wagon or six men load into either a truck or low type of railroad car. The large hopper bottom steel coal car, termed a battleship, cannot be loaded by hand, but it can be loaded by this type of conveyor.

It is by such methods that large stock piles can be made on the ground and rehandled economically with any type of car or vehicle. One thing that is necessary is to move the car or vehicle along as the conveyor loads it, for it is not advisable to move the conveyor any more than is absolutely necessary.

It is even possible to use these conveyors at the ledge to load for direct delivery and also to handle stuff into a high type of car for delivery to the crusher.

More Interest In Politics

BUSINESS men who decry such a thing as close attention to political affairs might well take the trouble to analyze the soundness of this view. They would have had a splendid opportunity had they heard the address of Governor Preus of Minnesota at the Mining Congress in Chicago.

The Governor advised increased interest, not only in the strictly local manifestations of politics, but in the more basic features as well. He called for a careful study of the larger and more general tendencies of public thought and a better understanding of the attitude of various groups towards the most highly prized of our existing forms and institutions.

Governor Preus is right; we should look past the details of our various business occupations occasionally and give some attention to those things which make business possible. We are too prone to accept the blessings of our constitutional guarantees as a matter of course. We forget that here and there interested minorities are working for the adoption of substitutes for our present institutions that are, in most cases, a direct negation of the principles upon which any business is founded.

Take for example, just one of these pernicious activities, the Socialistic movement toward denial of the right to private property. At present there is no reason for a great amount of concern over this movement—its adherents are few, their cause unpopular, and their chances of any degree of success slight. But the point is that there *is* such a movement and it *may* grow to more dangerous proportions. As a matter of fact it *has grown* to some extent and raised its menacing head in a number of places. Some people in this country believe that Russia has a government we might emulate.

But this is only an illustration. Any business man can find movements that concern him more directly here and now. Let him study local and national tendencies a little more closely and he will find many things that he should oppose more vigorously; many things, too, that he should support more heartily.

He can give support or opposition, both as an individual and as a member of various business associations. As a citizen it is his duty to study candidates carefully and vote for correct principles rather than for men who align themselves more readily with his smaller likes and dislikes. As a member of an association he should help his group study larger tendencies of the body politic and should vigorously back up protests against unjust, radical or recationary movements and corrupt or stupid practices.

All of this, of course, is mere generalizing. But sometimes it is well to turn away from the particular details that make up what we call our day's work. After all, each separate business is directly influenced by the general trend of events. Why not study that trend and lend a hand toward directing it?

To do this effectively, we need not rack our brains over abstruse political theories, we need not steal time from our work to devote to economic or other speculations. We believe that this country can best be held to the course that its founders contemplated by the application of what we may term "generous selfishness." That is to say, if every man in the country will find out what is his justly, and will then see that he gets it, no more and no less, the purpose of the constitution will have been served and its benefits realized.

And so, each and every one of us should find out more clearly what are the just and proper requirements of the business to which we belong. We

should see that we neglect none of the duties of citizenship, we should encourage greater and greater activity on the part of our local and national associations and should give all possible assistance to make those activities as effective as possible.

Iowa Association Asks Lower Rates

CONDITIONS in Iowa sand and gravel trade showed a distinct improvement during the early weeks of October and the last week of September. Road building work has not called for a great amount of material but there has been some activity in building construction. Prices throughout the state average 76 per cent of the 1920 peak prices. This figure is arrived at from reports of firms showing a range from 60 per cent to 90 per cent of 1920 peak prices. Prices in Des Moines are very spotted, running from 70 per cent to 87½ per cent of 1920 peak prices.

Some really constructive work is aimed at in the action taken by the Iowa Sand and Gravel Producers' Association to secure more equable railroad rates for sand and gravel. To understand the situation here it is necessary to remember that Iowa rates are all for line hauls and that the trade has not the benefit of the special rates found through Illinois and Wisconsin. The situation is best explained by the letter of Mr. R. C. Fletcher, president of the Association, to the Iowa Board of Railroad Commissioners.

"We understand that you have in prospect a hearing in re Iowa intrastate rates on soft coal and that that subject will receive attention in the relatively near future. We respectfully petition that if possible at or about the same time that there be given consideration by you to this matter of ours for a reasonable revision on sand and gravel in carlot quantities moving within our own state of Iowa.

"Your attention is respectfully called to the fact that for a long time the rate on sand and on gravel, straight or mixed carloads, for the St. Louis-Kansas City service was 9c per 100 pounds. This rate is published in Item No. 2480, page 62, of Freight Tariff No. 1-M, Western Freight Tariff Bureau, issued by E. B. Boyd, Agent, I. C. C. A-1089. The said 9c was increased following Ex-Parte 74 and now is 12c per 100 pounds or to state it differently it is $2.40 per net ton.

"In the recent report of the Interstate Commerce Commission: 'Walter S. Dickey v Director General, as Agent,' 62 I. C. C. 223-225, there has come to our notice that in said finding of June 15, 1921, the Interstate Commerce Commission found that the charges which had there been exacted were unreasonable to the extent that they exceeded those which would have accrued at the 1½c per 100 pounds based on the actual weight of the shipments. The equivalent of 1½c, of course, is 30c per ton, and we believe a correct scale of intrastate rates on sand and gravel, straight or mixed carloads, within the state of Iowa, would be made by prescribing and publishing rates 30c per ton for five miles and graduating the rate up from said 30c per net ton proportionate to the respective services to and including the rate of $2.40 for the Iowa 265-mile River to River service."

So far no date has been set for a hearing, but the producers hope soon to be able to state their case more fully in a conference with the Board.

A temporary restraining order was issued against the Building Trades Council of St. Louis and officers of the local branch of the Journeymen Stone Cutters' Association of North America forbidding them from interfering with the sale or transportation of the products of twenty-six stone contracting companies in the Bedford, Indiana, district.

A Quarry Without a Crusher

By DANIEL J. HAUER

A QUARRY that produces finely broken stone without a crushing plant is a rarity. It is true that many that produce lime or building stone, etc., are without crushers, but even such quarries as these today have either crushers or grinders to take the offal stone or rock that is not suitable for other purposes.

The writer recently visited the quarry of the Kennedy Refractory Co., at Landisville, Pa., and found that neither crushers, kilns, grinders or mills were used in this quarry, the stone simply being excavated and shipped.

The stone quarried is a dolomite. The ledge, which seems to be of great depth, has been disturbed in the past ages by earth pressures, so that the strata stand on edge instead of lying flat or horizontal.

The quarry has been worked for several years, but until the past year by hand methods.

The stone being on edge, and being drilled and shot with dynamite, and then picked up with a steam shovel, breaks up so that about fifty per cent of the stone is smaller than 6 inches, running down to sand. The rest will be 1 and 2 men stone, most of which can be easily broken by sledges. This stone is loaded onto railroad cars and shipped to Bainbridge, Pa., where the company has another quarry. The stone from the two quarries is mixed and burned in kilns, producing a refractory product sold under the trade name of Kennemac.

Until the past year, the methods used were all by hand. Holes 20 feet or more in depth were drilled by long churn drills, men sinking the holes by hand. The holes were shot with Du Pont dynamite. After shooting the holes, men with hammers, picks and shovels, break it up enough to load it into V shaped steel cars, made by the Lakewood Engineering Company. These cars are pulled up an incline, the track being 3-foot gauge, by a Lidgerwood hoisting engine to the ground level. This hoisting engine is located in a house at one side of the quarry, the house on the quarry side having windows along the entire length, so that the engine runner can see all the operations in the quarry. The cable runs from the engine to a large sheave at the top of the incline and thence down into the quarry.

From the top of the incline a dinkey made by the American Locomotive Works take the cars in a train to a tipple about a quarter of a mile away. This tipple runs over a side track of the railroad and the stone is dumped from the Lakewood cars into the railroad cars. Three large cars are shipped daily.

The stripping is quite light and has been done by hand in the past like the other work. From 30 to 40 men have been worked in this dolomite quarry.

Within the past year, machine methods have been substituted for hand work.

An Erie type B shovel has been used for the stripping and as this takes but a short time to strip a considerable area, the shovel is used at the ledge to load the Lakewood 2-ton cars. The cars are spotted under the shovel without aid of the dinkey.

The drilling is now done with a Clipper blast hole drill made by the Loomis Machine Co., of Tiffin, Ohio. This machine is run by steam, but does not carry a boiler, the steam being furnished by a central 100 H.

P. boiler, which also furnishes steam for the hoisting engine.

The cars are handled in the same way as when the drilling and loading were done by hand.

A great contrast is made as to the employment of men since the machinery has been installed, for now seldom more than ten men are used at all the work. This shows a decided saving in labor and means the shovel and other machinery will quickly pay for themselves. It would also be possible to greatly increase the output of the quarry by increasing the train service.

It is quite surprising the number of small quarries that persist in following obsolete hand methods in operation, claiming that their proposition is not one that will be economical for machine methods. This quarry completely refutes such arguments. It is always possible to increase production by machinery over hand-methods — that proposition seems clearly understood; but many business men fail to comprehend that with a limited output it is frequently possible to reduce the cost of production by installing machinery. This for excavation has been demonstrated over and over again in many brick yards throughout the country, where the amount of clay excavated will run from 50 to 100 cubic yards per day, and the small revolving steam shovel has cut the cost of excavating this clay in half.

What has been proven true of clay pits, has been found true for sand, gravel and stone pits, and this has especially been the case during the past few years when the labor market has been demoralized and far from being normal.

No better example of this could be found than in the quarry described in this article.

An economical arrangement at this plant is that the boiler house has been built large enough to give shelter to the locomotive and cars when not in use and also afford room for the blacksmith shop.

This quarry being worked as a pit quickly collects water from the surface and the ledge. To keep this water under control, a duplex pump is operated by steam from the 100 H. P. boiler.

The E. J. Mann Stone Co., 6 Washington Street, Cumberland, Md has been organized with a capital of $10,000, to operate local properties. The company is headed by Earnest J. Mann, James W. Thomas and P. Clarence Barnes.

The Westmoreland Lime Products Co., Wilmington, Del., has been incorporated under state laws with a capital of $100,000, to operate limestone quarries and kindred properties. The company is represented by the Delaware Registration Trust Co., 900 Market Street, Wilmington.

"From cover to cover"

Says Schroeder

J. F. SCHROEDER

J. F. Schroeder, general manager of the Linwood Stone & Cement Company, Davenport, Iowa, writes:

We have become so accustomed to looking for your monthly magazine that if we should fail to receive same, we would be very much disappointed. We digest your magazine thoroughly from cover to cover, in order to see whether anybody else is handling their affairs in a better way than we are, or whether there are any new machines or ways of handling quarry products which might benefit us. We feel that you are always wide awake interviewing quarry men and visiting plants so as to let the public in general know if you find anything worth while in your travels. We also look over the advertisements carefully in order to know whether some people have something to sell which would be of benefit to us and also whether anyone wants to buy something which we may have to sell. We believe that your little magazine should be read by everyone interested in our industry, and hope that you may continue to receive the success which your magazine merits."

"It Looks Good to Me!"

Reduce Your Accidents

IN a recent report made by the Bureau of Mines of the Department of the Interior upon accidents in quarries, it was gratifying to note that the number of deaths and injuries was considerably reduced over previous years, yet the accidents in the business are still too numerous.

The greater number of accidents are due to four causes:

First, at the ledge, due to handling the rock and to slips and slides of rock and overburden.

Second, to the use of explosives.

Third, to the hauling or transportation of the rock.

Fourth, to the use of machinery.

Knowing the cause of almost anything, it should be possible to prevent such things from happening. If quarrymen know where and how their accidents occur, it should be possible to reduce them greatly if not entirely.

The first cause, as set forth in the government report, can be cared for if the proper regulations are made. More than half the accidents in the world are due to people being in a hurry. This is true of automobile driving, and it is true of quarrying. An apt story will illustrate:

It is said that a quarryman owned a quarry some miles out of Rochester, N. Y., and his office was located in that city. A chauffeur drove him in his automobile back and forth from the quarry to the office. One day a new driver started with the quarryman from the quarry to go to his office. The chauffeur began to go at a high rate of speed. The quarryman waited a few minutes to see if he would slow down the car, then tapping the driver on the back he said, "Young man, I would rather be fifteen minutes late in reaching my office in Rochester, than on time in h—l." It is needless to say the driver reduced his speed.

So it is, working at a ledge. A large blast is made, and the men are placed immediately at picking up the work. It is possible to put men at work picking up the scattered rock, but before any of them work close to the ledge, every loose rock should be either barred or blasted down.

Generally ledges are stripped before blasting is done, so that, under such circumstances, there cannot be slides of the overburden. But where the dirt is shot down with the rock, then there is great danger of slips, especially just after a blast or a hard rain. This makes a bad condition that can be overcome only by placing men to clean off the ledge wherever there may be any chance of the overburden sliding or falling to the quarry floor below.

Too frequently large masses of partly loosened rock are allowed to hang on the ledge, and the men become so accustomed to seeing these rocks and working under them that they pay little attention to the ledge until an accident happens. It is the part of the superintendent or the quarry operator himself to see that all such pieces are thrown to the quarry floor.

Men picking up rock should not be allowed to work below men who are barring out and breaking up boulders in the pile above.

All of these things mean the making of hard and fast rules that no one should be allowed to break. To prevent accidents when using explosives the same thing must be done. Thus it is bad practice to let every man in a quarry handle explosives. Nor should explosives be allowed to lie around in the quarry or on top of the ledge.

First of all, only men detailed for the work should be allowed to handle explosives, load holes and make blasts. Calling men in an indiscriminate manner to carry a box of dynamite is

wrong. If such a man is clumsy and easily or frequently stumbles and falls, he is not fit to carry explosives. It may not only mean his death, but possibly injury and death to others.

Not only should there be a magazine and house for storing fuse, caps, etc., at some distance from the ledge, but close by the quarry there should be an explosive work house. Here a few extra sticks of dynamite can be kept and in this shack, caps can be crimped into fuse and cartridges can be primed with caps or exploders for blasting. By adopting such a method this dangerous work is done away from the main gang.

There are many precautions that should be thrown around the blasting. It is not enough to make up a set of rules to safeguard men and property, but it is necessary for some one or two men to see that the rules and regulations are followed.

Unless for unusual need, a blast should not be put off during working hours. No blasting should ever be done until the blasting signal is given. This can be the blowing of a whistle or horn, the ringing of a bell or steel triangle or the making of some other loud noise. The same signal should be given after the blasting is finished. If a quarry is in a public place, guards should be posted at dangerous places to warn people.

If there are not safe sheltering places for the men, some should be built. Men should never be allowed to hide behind boulders and under overhanging ledges of rock. Too many have been covered up in this way or otherwise injured. To the men who pull the batteries and light the fuses, ample sheltering should be provided. These men always run chances of being injured, but the hazard should be kept to the minimum.

Every quarry should have a testing machine, not only to test each electrical exploder before being used, but also each charge as it is placed in the hole, and see that a circuit is perfect before attaching the blasting battery. Too much care cannot be exercised.

It is not surprising to those who are versed in quarry operation that there is a heavy toll of accidents in hauling. In spite of this most operators are lax in the way they allow men and boys, especially the latter, to walk on tracks and ride upon cars.

One reason that much walking is done upon the tracks in a quarry is that the floors of quarries are allowed to become so littered up with blasted rock that it is only possible to walk with any comfort upon the tracks, for these must be kept free. For many reasons, especially that of safety, quarry floors should be kept clean and everyone should be prohibited from walking upon the tracks. It matters not whether cars are allowed to coast, are pushed by hand, pulled by horses, or operated by power motors.

No one should be allowed to ride on the cars or motors, except those men employed to operate them. It seems so reasonable for a man carrying a jack or a heavy load of drill steel to put the load on a car or motor and ride with it, yet case after case of accidents and deaths have been the result of this. If these things are to be handled upon cars, then they should be made a regular load and handled in the ordinary manner of operating the cars. Even when cars are pushed by men or pulled by horses no one should be allowed to ride upon the cars. Too many men have already met their deaths in this way. Men jumping on and off of even slow moving cars are always in great danger.

In handling derrick skips, men should not be allowed to ride in them, nor should skips be swung around close to where men are working. Under no circumstances should a piece of rock be allowed to remain in a tripped skip.

Much has appeared in PIT AND QUARRY during the past few years on the guarding of machinery so that accidents will not occur. Stress has been placed upon the placing of guard rails and screens so that men cannot get caught in moving machinery, and upon the need of signs placed at dangerous points, especially where electrical wires must be run, but the best precaution is to forbid men to go near moving machinery unless their work demands their presence there. The engine room should not be the place for the men to rest and loaf and eat lunches. The same is true of a crusher plant or a steam shovel.

If men are kept away from machinery they cannot be injured and, if machinery is properly guarded and protected, the operators of such machines are not apt to be injured. It is better to spend some money to prevent accidents, than to spend larger sums righting the injury done.

Roller Bearings

A quarryman recently asked one of the editors of PIT AND QUARRY, "Do you believe that if I equipped my crushers and other machinery with roller bearings, that I could save myself 10 per cent of my coal bill?"

The answer was, "Yes."

The drag of rough, poorly fitting bearings, that are difficult to lubricate, is great and means much friction in operating machinery. This causes more power to be used and likewise wears the bearings excessively. As soon as a bearing wears more at one spot than another, unless the lubrication is exceptionally good, the wearing at other parts of the bearing increases and it is not long before the entire bearing is running lopsided.

Unless such a bearing is re-babbited and made true at once, then the output of the machine is reduced and the cost of the power is increased.

Roller bearings are the best balanced of any in use on machinery. Such bearings have made possible the moving of heavy loads on trucks at an economical cost of power. As has been done for these by rolling bearings, so can be done for many stationary plants.

Roller bearings run true at all times, for the wear comes on all the rollers alike, and they continue to run true until the rollers are considerably worn and have to be replaced. The space in the bearings provided for the rollers admits of the lubricating oil entering freely and being distributed evenly. This again means that the bearings will run with less friction, for lubrication is done to prevent friction. The saving of friction means the saving of power and this can and will be shown in the coal bills.

Not only are these things true, but the life of a machine equipped with roller bearings is made much longer. To equip a plant throughout with roller bearings may mean a fairly large expenditure, but this money is quickly returned in the various savings effected.

The United States Gypsum Company, which has a large plant near Genoa, Ohio, is planning the erection of a large retarder plant. The new mill will be far enough from the town to eliminate the objectionable odor from the retarder.

The Cairo Sand and Gravel Company, Cairo, Ill. ,is gettnig ready to put in an extensive plant near Davis Junction. The company will take sand out of the river bank, carry it over a railroad three-quarters of a mile long and deliver it washed and screened in bins on the Iron Mountain railroad right-of-way. This company is incorporated for $30,000 and the stockholders are: Dr. N. W. Cox, president; A. L. Sanderson, vice-president; P. B. Archibald, secretary and manager, and Lee Johnson, treasurer.

Biesanz Stone Company

Winona, Minn., Concern Operating Gravel Pits and Quarry in Efficient Style

THE Biesanz Stone Company, operating three sand pits and a stone quarry at Winona, Minnesota, is one of the really big concerns in that section of the country. They have just finished a very successful summer season, taking out a large amount of gravel. Extensive improvements on the quarry have curtailed production in that department considerably but, with all the new machinery practically in operation, they are looking forward to a busy time in the near future.

This concern is owned by Mr. Chas. P. Biesanz who, with Mr. Chas. Deering, superintendent, takes care of the active management of the quarry and the pits. The company has about 170 acres of land over practically all of which there is an extensive gravel deposit running to a depth of 35 feet. The sand and gravel occur in about equal proportions and the percentage of foreign substances is very small.

The Biesanz Company, besides turning out a large amount of washed gravel, also load a considerable amount of pit run gravel directly into cars. Oversize does not exceed one per cent. The output of the pits is about 20 cars of screened gravel per day, besides considerable pit run gravel.

This material is taken out at the large pit by a Lidgerwood crane, passed on to a belt line made of Goodyear rubber belting and fabric belting. This belt conveyor runs along the edge of the pit as shown in the photograph, turns corners by passing through a small hopper, until it reaches the elevators which carry it to the screens and settling tanks. The work of screening is handled by Gilbert rotary screens. Water for the screening and washing is supplied by three centrifugal Amsco pumps, 4 inches in diameter, and having a capacity of 500 gallons each per minute. What little oversize occurs is reduced to desirable size by a Symons disc crusher, and carried to the proper bins. Except for the cranes which take the sand and gravel from the pit, all the machinery is operated by electric motors. This pit is connected by a short spur track to the main line of the Northwestern Railway, and also by a continuation of this spur track to a smaller pit. By travelling a short distance along the main line of the Great Western to another spur track it is possible to connect directly with the quarry. All switching and moving of cars around the pits and quarry are done by a Davenport locomotive.

The smaller pit is used mostly for taking out pit run gravel, but the material can also be put through screens to help out when too much work is thrown on the larger pit. The gravel and sand are taken out by a Lidgerwood crane and either loaded directly into cars as pit run stuff, or passed on to a hopper which has a set of Gilbert rotary screens. A conveyor designed and constructed in the Biesanz machine shop passes the washed gravel up to the cars. All machinery at the smaller pit with the exception of the crane, is operated by electricity. Water is supplied by a pipe line from an Amsco pump, operated by a General Electric motor. This pump and the pumps at the large plant take the water from the pit itself, which happens to be at river level. The Mississippi river is about 1¼ miles distant and, for this reason, there is sure to be at all times, through subterranean connection, a plentiful supply to water.

There is also a third Biesanz pit located along the main line of the Chicago, Milwaukee, & St. Paul railroad, which was opened up about one year

and a half ago for the purpose of taking advantage of the lower freight rates. At this plant there has been a very limited outlay for machinery, but it helps the company to make considerable saving on each car of material shipped to points along the Chicago, Milwaukee, & St. Paul railroad.

At the Biesanz Company's quarry the main activity up to this time has been the production of cut stone, although considerable crushed stone has also been produced. It so happens that the stone in this quarry is of just the quality needed to make a good substitute that was demanded at the time of the war, when shipments from the famous Léverno quarries in Italy were cut off. At that time the Biesanz company shipped large quantities of this stone to New York City. The stone was sent out in rough blocks, sawed into slabs in New York and polished with corundum until a finish was secured that made the stone a splendid imitation of marble. Of late the demand for this stone has dropped off, but it is expected that it will revive soon again.

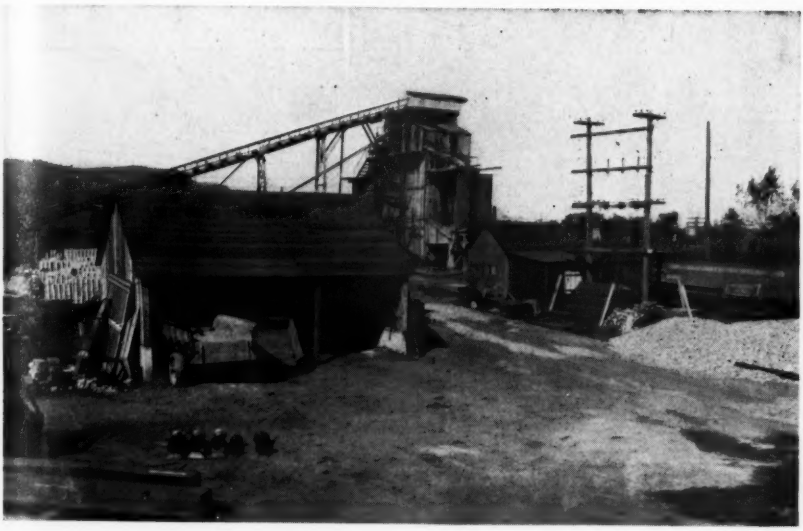
The quarry is located at the top of a hill some 200 feet above the crusher. The stone is blasted and barred out, carried by derrick and team to a tramway and dropped by gravity to the crusher below. At the same time that the loaded car goes down it hauls up an empty car. In the quarry above are a 5x7 Sullivan air compressor and a 9x12 Chicago Pneumatic air compressor used to operate the Sullivan and Chicago Pneumatic air hammers and Chicago Pneumatic blast hole drill. Besides the tramway running between the quarry and the crusher there is a team track which can be used in case the tram should get out of order.

Cut Stone Ready for Shipment

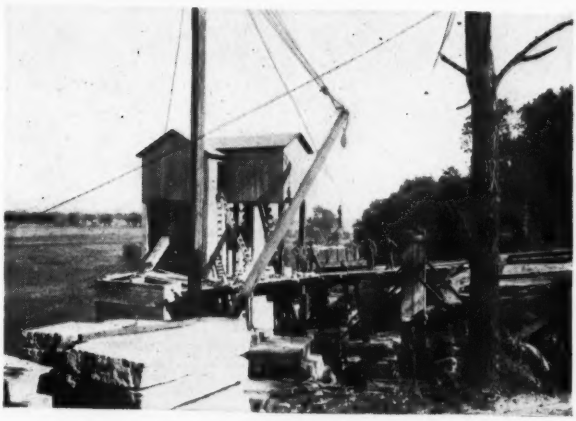
The New Concrete Crusher and Storage Building

When the cars of stone reach the foot of the hill they are dumped on a platform from which is fed a No. 3 McCully Gyratory crusher. The reduced stone then goes through a set of rotary screens to the proper bins, from which cars are loaded at the side, as shown in the accompanying illustration. Rejections from the screens are passed back to a No. 2 Williams crusher and reduced to proper size. All this machinery is operated by one 75 H. P. and two 10 H. P. General Electric motors.

At the bottom there is also a stiff leg derrick and hoist which, when occasion demands, can take the blocks of stone directly from the cars at the foot of the tramway and load them into freight cars on the switch track.



Plant of Biesanz Stone Company Winona, Minn.



PLYMOUTH

A single PLYMOUTH Locomo- | MOUTH Locomotive shown above

A single PLYMOUTH Locomotive can easily deliver, over the average haul, sufficient clay for making 400,000 brick daily. That's why the PLYMOUTH is an indispensable unit in a clay pit equipment.

We caught the busy C. H. Klein in his banking house at Chaska, Minn., and he hesitated from his supervision long enough to say that the PLYMOUTH Locomotive shown above had been in service two years, and so satisfactory that he was rooted in the faith that the PLYMOUTH was not only economically capable, but actually indispensable.

That's saying it pointedly and compactly. If you have pit or quarry haulage write us for Bulletins showing performance photos.

THE FATE-ROOT-HEATH COMPANY, Plymouth, Ohio

PLYMOUTH

Gasoline Locomotives

Portage Silica Company, Portage, Wis.

View of Portage Silica Company Plant, with Brick Drying Shed in Foreground

Taking out Core Sand and Loading Cars with an Orton and Steinbrenner Crane

The Pit from which the Silica Sand is Taken

Wisconsin Silica Plant

Newly Organized Portage Firm Owns Fine Sand Pits and Big Plant

THE Portage Silica Company is operating at Portage, Wisconsin, a plant for the production of silica sand which has a capacity of 250 tons per day and a possible output of 25,000 sand-lime bricks.

The deposit covers 48 acres, on which there is about 100 years supply of sand, that chemical analysis has found to be 99.45 per cent pure. There is but one-half of one per cent of aluminum and iron, a trace of lime and no magnesium oxide. About 5 per cent of the sand will pass through a 150 mesh screen; 8 per cent will pass a 100 mesh; 40 per cent will pass a 40 mesh, and the remaining 38 per cent will go through screens coarser than 40 mesh. The plant has been operating under the present management for about two years. They have taken it over from a concern which gave up operating about seven years ago. This period of idleness, meant of course, that much new building was necessary before the plant could begin again to be put on an efficient basis of operation. In fact, eighteen months of the last two years have been devoted to this work, and only six months to actual production.

The president and general superintendent of the new plant is Mr. J. M. Thouvenell. Mr. J. H. Koepp is superintendent at the silica pit. This company has just acquired title to the pit of the Pacific Core Sand Company, an adjoining plant. Mr. A. N. Koepp is superintendent there. Both plants represent a total capital of $200,000.

Mr. Thouvenell has had considerable experience in brick making and the production of silica sand in its various forms. Before taking charge of the plant at Portage, he spent considerable time in the study of similar enterprise throughout the country and brought back to his work an understanding of the very latest developments in the industry. He contemplates making changes and improvements in the operation of both the silica plant and the core sand plant, but is going about it slowly, adding new equipment and making alterations bit by bit. Much of the machinery in the old plants has been replaced and the method of operating changed.

Inclined Belt Conveyor, Leading to Storage Bins

The material is taken from the pit by blasting and barring, is loaded by hand into cars, and taken to a Williams primary crusher, which was installed last September. This crusher reduces the material to ½ inch. It then travels on to a set of Cornish rolls weighing 16,000 pounds

Core Sand Pit, with Orton and Steinbrenner and Thew Cranes

which reduce the sand to its natural grain size as shown in the screen tests. The company has just installed a Simplex screen to remove any lumps that may get by the crusher rolls. From there the material is taken by conveyor belts to storage bins with a capacity of 10 cars from which it can be loaded direct.

At the present time the Portage company is devoting all its energy to the production of grain sand, giving up for a time the making of brick. The brick plant includes a complete set of brick making equipment, but the demand for grain sand furnishes a big enough market. The brick plant consists of a large tube mill, bins, mixers, crushers, steel silo, tanks, brick presses, brick hardening cylinders, special tanks, and 55 steel brick flat cars.

The power of the plant is furnished by a 150 H.P. Skinner automatic engine and a 50 H.P. Morse engine. The electric current is produced by General Electric generator set.

The core sand pit covers 202 acres and contains sand so pure that it has been shipped as far away as Hamilton, Ontario. It is used quite extensively in making asphalt pavement. At the pit the sand is taken out by a Thew shovel equipped with a one yard bucket and by an Orton and Steinbrenner crane with a ¾ yard clam shell bucket. The capacity of the plant is 20 cars a day. 800 cars were produced last summer.

The spur loading track 3,500 feet long is laid on the company's right-of-way and connects the silica plant with the Chicago, Milwaukee & St. Paul railroad. It also has a track in the core sand pit.

Among the customers of the Portage Silica Products Company are many large foundries, glass plants, soap works, art cement manufacturers, and representative concerns in a variety of industries.

Remarkable Cement Trade

September Established a Record —Figures for First Nine Months of Year

THE movement of portland cement continued on a large scale throughout September, more than 11,300,000 barrels having been shipped from mills. Shipments of portland cement during the third quarter of the year were approximately 33,970,000 barrels, establishing a record for this quarter. For the nine months ending September 30, 1921, the shipments amounted to 74,045,000 barrels, which exceeds the former record volume moved in the corresponding period of 1920.

Favorable operating conditions are indicated by the large September production of 10,027,000 barrels of finished cement, which established a record for that month. The average daily production was greater than that of August, and had there been as many days in September as in August the September production would have shown the larger total. Production for the third quarter likewise established a record, and for the nine months ending September 30 the production was about 99.8 per cent of the record quantity made during that period last year.

Stocks of cement at the mills were drawn upon to supply demand during September, as is customary in the season of active demand. At the end of the month stocks of finished cement at mills were approximately 6,953,000 barrels, compared with 8,280,000 barrels at the beginning of the month. This is about 135,000 barrels below the average for the month of September, 1917-1921.

The production of clinker, or unground cement, in September was approximately 8,329,000 barrels, which

was a record for September and for the first nine months of 1921. Stocks of clinker at the mills amounted to about 3,200,000 barrels at the end of September.

Wholesale prices of portland cement per barrel, without bags, in carload lots, according to quotations published in trade papers, ranged as follows, the lower figures representing the quotations for the last week or two of September, 1921: At New York, $2.69 to $2.75; at Chicago, $1.97 to $2.17; at Minneapolis, $2.26 to $2.41; at Denver, $3.10; at San Francisco, $2.89 to $3.09; at Seattle, $3.10; at Atlanta, $2.69 to $2.75; at Dallas, $2.80; at Montreal, $3.10. These prices, except those at New York and Denver, which are considerably lower in 1921, are nearly the same as the prices quoted one year ago.

These statistics, prepared under the direction of Ernest F. Burchard, of the United States Geological Survey, and shown in the following table, are based mainly on reports from portland-cement manufacturers and in part on estimated data. When considered in connection with the low demand for other commodities they show that the market for cement has been remarkable. A large quantity of cement, possibly 20 per cent of the output, is now going into the construction of concrete roads; this is a large increase over former periods. The value of building permits issued during the last three months has shown an enormous total. A revival of building activity is well under way—probably to a greater extent than is generally realized. A great deal of the cement used in construction work is being consumed on small to moderate-sized jobs, as few large engineering projects are under way and industrial buildings are at present being constructed on only a small scale.

The Bureau of Foreign and Domestic Commerce, Department of Commerce, reports that imports of hydraulic cement in August amounted to 10,988 barrels, valued at $32,315; the total for the first eight months of 1921 was 60,252 barresl, valued at $216,892. The exports of hydraulic cement in August were 84,538 barrels, valued at $295,183; the total exports for the eight-month period were 848,971 barrels, valued at $3,253,463. The exports are not keeping pace with those of 1920, in which there were nearly 3,000,000 barrels exported during the year.

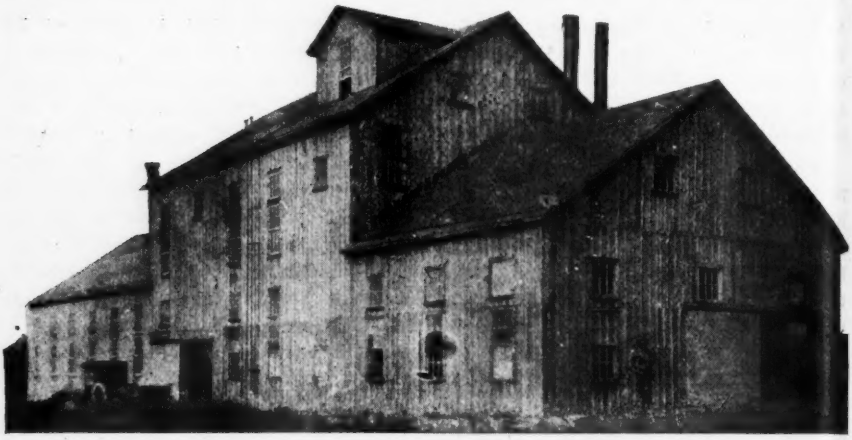
Production, shipments, and stocks of finished portland cement, in first nine months of 1921.

Month	Production (barrels)	Shipments (barrels)	Stocks at end of month (barrels)
January	4,068,000	2,539,000	10,300,000
February	4,379,000	3,331,000	11,400,000
March	6,763,000	6,221,000	12,000,000
First quarter	15,240,000	12,001,000	
April	8,651,000	7,919,000	12,600,000
May	9,281,000	9,488,000	12,450,000
June	9,296,000	10,577,000	11,150,000
Second quarter	27,228,000	27,984,000	
July	9,568,000	10,301,000	10,414,000
August	10,244,000	12,340,000	8,280,000
September	10,027,000	11,329,000	6,953,000
Third quarter	29,839,000	33,970,000	
	72,307,000	74,045,000	

The Escambia Sand & Gravel Corporation, with authorized capital stock of $200,000, is putting in a plant on a large gravel deposit along the Escambia River near Flomaton, Alabama, about 40 miles north of Pensacola, Fla. Operations are expected to begin within 30 days. The officers of the company are C. D. S. Clarkson, Pres. C. H. Horrell Vice-Pres. and P. N. Downman Sec.-Treas. with offices at Flomaton, Ala.

The Blackwell Sand Company, Blackwell, Okla., recently organized to lift sand from the bed of the Chikaskia river to be shipped over the state, has installed an 80-horsepower engine and rotary pump at its plant near the city.

The Stanthony Sand Stone Quarries Co., Chicago, Ill., has been incorporated with a capital of $50,000, to mine, quarry, and deal in stone and minerals. Incorporators: Timothy J. Fell, room 1112, 113 West Washington street.



Fuller's Earth Plant at Clarksville, Pa.

Great Fuller's Earth Deposit In Pennsylvania

A CONCERN may be said to have a very good thing when it is turning out a material from which products ranging from oil filters to cosmetics may be made, and when it happens to own the largest deposit of that material so far found in this country.

The material is fullers earth, the deposit is located in Clarksville, Pa., and the concern is the Furness Corporation, which maintains offices at 343 South Dearborn Street, Chicago. Their mill is already erected and will soon be in operation.

Ever since engineers discovered this practically inexhaustible supply, samples of it have been going through numerous laboratory, factory and mill tests, and the results in each case indicate that the earth is equal to any of the high grade English bleaching clays which have, up to this time, been considered as standard.

In a recent interview Mr. F. C. Worth, Vice President of the Corporation, outlined for PIT AND QUARRY a few uses of the material which show pretty clearly the economic importance of the find.

Fuller's earth has a large sale in industries engaged in bleaching and filtering oils and greases of all kinds. The mineral oil refiners make use of it by allowing their products to percolate slowly through long cylinders filled with fuller's earth which has previously been ground to a certain specified fineness. The first oil through the cylinder comes out perfectly white and very thin, that which follows gradually grows deeper in color and heavier in weight until the product as a whole is of the required color and specific gravity. In the case of animals, vegetables and seed oils a different process is employed. Large tanks of the oil are heated beyond the boiling point and a quantity of fuller's earth running between 5 and 10 percent of the weight of the oil is added. After the resultant mixture has been thoroughly stirred it is run through bag filters or filter presses which sep-

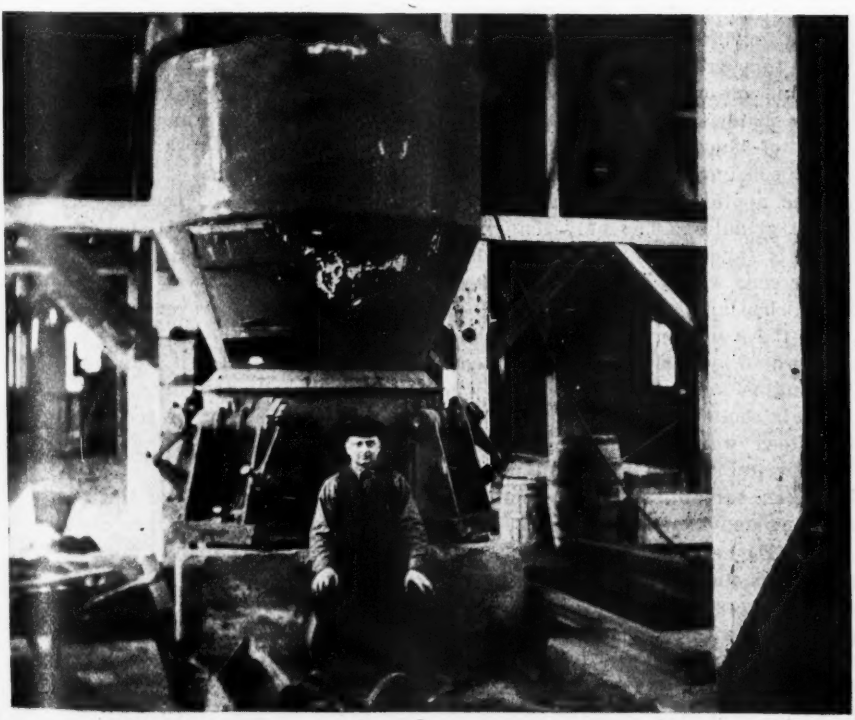
arate the earth and the oil. The latter appears as a pale straw-colored liquid, the foreign matter and coloring which it formerly contained remaining with the earth.

The oils with which it has been used successfully include those which occur in the manufacture of paint, pigments, oleomargarine, cocoanut butter, etc. It is also used in detecting coloring matter in certain food products, in the manufacture of a substitute for talcum powder, as a poultice, and as an antidote for alkaloid poisons. It is expected that new uses, such as deliming hides, will be developed.

The fuller's earth, after its use in oil mills for bleaching and filtration purposes, is used in the manufacture of hand soaps, asphalt preparations, and concrete waterproofing.

Quite a number of barber and beauty shops, including those in some of the prominent hotels of large cities, are calling for the material to make Fuller's earth packs. For this purpose the earth is supplied in the form of an impalpable powder. It is made into a paste with which the face of the person being treated is coated. fuller's earth packs. For this purpose properties and the preparation is said to be very effective for the removal of blackheads and the clearing up of greasy complexions.

The mill which will handle this interesting material is located on the Pennsylvania railroad near the new Penn station. All trucking and unnecessary haulage is avoided by the installation of private siding. The Erie railroad runs on the other side of the deposit and shipping facilities are, consequently, of the very best. The ma-



Interior of Plant

terial will be brought into the Chicago market at a very reasonable cost, partly on account of favorable freight rates, partly on account of the low cost of production.

When the earth reaches the plant it will be sent first through a Marine Iron Works disintegrating or pug mill. Here the first stage of reduction takes place and the material then goes on to the Cummer rotary driers, two in number, which remove the moisture. From the dryers the material is fed into a No. 12 Brainard hammer mill which has an opening feed of 5x12 inches and will handle 5 to 8 tons per hour, of which 90 per cent will pass through a ¼ inch mesh. The hammers, which weigh 100 lbs. each, revolve at a speed of 400 to 600 r.p.m and come in contact with the earth on the upstroke.

From the hammer mill the earth goes through the screen into the bins, except that part of it which is intended for fine pulverization and which is fed to a Kreutzberg pulverizer. This machine automatically distributes this coarse material, and results in a maximum of fines with a minimum of power consumption, because it permits all the applied power to be used for actual grinding. The pulverizing machine is followed by two Tyler whiptap screens with which there has been established ample bin capacity.

All the machinery used in the plant is operated by a 350 h.p. Hamilton corliss engine working from two 150 h.p. Phoenix boilers. In addition there are Reed water heaters, pumps and Underwriter's fire pumps. Repairs will be taken care of in a well equipped machine and blacksmith shop.

The Furness Corporation is composed of a number of experienced Chicago business men who are thoroughly acquainted with all phases of the work they have undertaken and expect, when the mill at Clarksville gets into operating condition, to make this baby industry a very important one. The officers are C. Furness Hately, president; F. C. Worth, vice-president; C. C. Zimmerman, secretary and treasurer.

As stated above, they expect to begin operations immediately and have installed all the machinery except that used for excavating the earth and conveyed it to the plant. The relative merits of drag-line and steam shovel have been thoroughly discussed, but so far no decision has been made. It is expected that this will be settled within a short time. In the meantime ordinary scrapers will be used—this being possible because of the absence of overburden.

Casing for Drill Holes

WITH well drillers being used for drilling deep drill holes in quarries when the overburden is light and stripping is not done, the writer has recently noticed in some quarries he has visited, that after the machine is set up, a hole is dug several feet square through the overburden down to the rock, and then the drilling is started.

This is done not because the drill will not make a satisfactory hole through the overburden, but in order to clear all dirt away from the top of the hole, thus preventing dirt from being kicked off the top of the hole and sifting down into it, to be either washed or pumped out. The movement of the string of tools will frequently keep dirt sifting down into the hole.

The hole dug through the overburden prevents this; but it is costly and means that short planks must be laid over the hole so dug, so that the men can handle the string of tools.

At much less cost there can be kept on hand several pieces of large pipe casing about a foot longer than the depth of the overburden. If the

holes drilled are from 4 to 6 inches in diameter then pipe 8 to 10 inches in diameter should be used.

The pipe should have a heavy coupling on the top so as to stand the driving into the ground. This piece of casing will prevent all dirt from getting into the hole and if allowed to stick from 6 to 12 inches out of the ground it will prevent any tools from being knocked into the hole.

The pipe can remain in place until the hole is drilled and loaded, then by means of a set of large chain pipe tongs two men can loosen the casing and pull it out. These pieces of pipe can be used over many times, if reasonable care is exercised with them. They give men solid ground to work upon around the hole.

The writer has used this kind of casing and in some cases where they have not been easy to get out of the ground they have been shot out in the blast, and only in a few cases have been injured. But it is better to withdraw them before blasting.

Stemming Holes

SAND is the best material for stemming holes. It runs easily if dry and almost packs itself; but in many cases it is difficult to obtain free running sand. In crushed stone quarries, crusher dust can be used for stemming and it will be found almost equal to sand. When this is not available then light loam should be used. If it is necessary to use clay it should be dried on top of a boiler, and there pulverized with a heavy stick or hammer so it will go into the hole easily.

Before placing the stemming in a hole, pick up all the paraffined paper wrappers taken off the powder and ram them into the hole so as to keep the stemming separate from the explosives, then let the stemming go into the hole, packing it by means of the tamping stick as it falls.

Cleaning Gravel

A READER writes that his company is dredging gravel from rivers and streams, and at times find the gravel mixed with heavy clay and much decayed weed and vegetable matter. He gives a short description of his dredge and asks how his screens can be reset to allow him to clean the gravel so it will be available for concrete work.

The information given is meagre and it is always difficult to advise anyone without knowing all the local conditions, but it would seem that the chief trouble here is not with screens, but instead it is a case of washing.

It is true that by using larger screens and setting them at a different angle, that is, so flat that the gravel will barely move along in the screen, and by increasing the speed and sometimes the diameter of the screen, that much more dirt can be taken from the product, but if the clay is plastic and there is a great mass of weed and vegetable matter, the chances are that washing must be resorted to in order to have a clean product.

When gravel is wet it may seem quite clean; but if when dry is has a slight film of powdered clay on it, such gravel is not suited for concrete, for this clay will prevent cement from adhering to the pebbles. The only remedy is a thorough washing.

Such washing may be done in connection with the screening, but in some cases the washing must be a separate operation, especially if both sand and clay are mixed with the gravel and it is desired to reclaim the sand as well as the gravel.

The exact methods to follow and the kind of plant to use can only be decided upon when all the local conditions are known, and this generally means a trip to the scene of operations.

Inclines for Quarry Pits

MANY stone quarries are in pits, and in those producing crushed stone, cars are frequently used operating up inclines.

Such inclines are generally built upon wooden trestles. This means not only an expense in building, but one of annual upkeep, with the possible danger of accidents due to a high trestle. Much of this could be saved by building the incline in the rock, thus saving the building of a trestle and giving a solid road bed to lay the track upon.

In starting many pit quarries, derricks are used to raise the stone out of the quarries. Such derricks are so situated as to handle skips or buckets into a quarry and also dump them into the crusher. For this reason, close to the crusher the wall of the pit is generally made vertical. This means that when the time comes to put in an incline it is necessary to build a trestle for the track. However, it is evident that the work of developing the quarry has not been thought out along any decided plan and then followed.

This journal has repeatedly impressed upon all those about to start a quarry that the first thing to do is to make a plot of the quarry and plant site and on this lay out the buildings and quarry development, not for a day or a week, but for years, so that the quarry will be developed along the best lines possible and to give the most economical results.

If this is done, then enough rock, and at the proper slope, can be left in the pit in front of the plant to be used as an incline. This need not interfere with the free use of derricks in developing the pit, for they can still be used to serve a large area, as shown in Figs. 1 and 2. One shows a derrick set up opposite the incline serving both sides of it, the incline as it is developed, and the crusher. In Fig. 2, there are two derricks, one on each side of the incline, so that even a larger area can be served by the two. These sketches show how the incline can be built without interfering with the developing and without extra cost, except to trim it.

The width of the incline should likewise be decided upon when the quarry is opened up; not the width that may be needed at first, but when the quarry is being worked to its greatest capacity. For small quarries, there should be room provided for at least two tracks, in some cases three are better, while in large quarries there should be room for at least four tracks and even up to six.

Today it should be understood, with the modern large crushing plants and steam shovels that can pick up five tons or more at a dip, that the limiting factor in production is that of transporting blasted rock up the incline. There should be enough tracks so that cars can be approaching the crusher at all times. This is the only way to keep the crusher grinding continually. There must be enough tracks to return the empties to the pit without in any way interfering with the loads coming out. The subject of

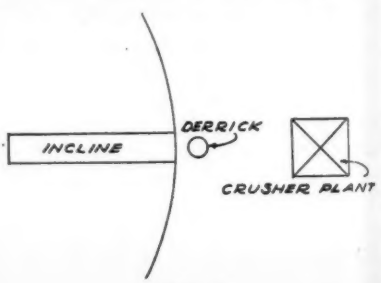


Fig. 1

how to operate cars on an incline will be discussed at some other time.

The consideration as to the incline next to the width, is that of the length, as this governs the steepness or grade. Due to the fact that most inclines are built upon trestles, and in order to keep down the capital expenditure, the length is curtailed, making the grade very sharp. This means to add much to the annual operating expenses.

It is not an uncommon sight to see inclines built at an angle of 30 to 45 degrees and sometimes slightly steeper. This means a large consumption of power, and it is a needless drag to have an incline at such sharp angles. It means in many cases to limit the load that can be pulled.

If the incline is blasted out of the rock, such gradients are seldom necessary. The angle of the incline can be kept down, except in rare cases, to less than 30 degrees, generally between 15 and 25 degrees. This is as it should be.

If the angle is made about 20 degrees, for a pit 100 feet deep, an incline about 500 feet long will be needed. A train of several cars can be pulled up such a grade by a hoisting engine and also by a geared locomotive.

Thus the cost of operating such inclines will be nominal, for the only maintenance cost will be that for track work and the operating cost will be much less when easy grades are established.

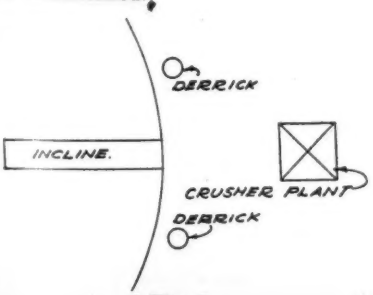


Fig. 2

Contracts on 95 Miles

Illinois Lets This Amount of Concrete Road Work

THE Illinois state department of public works announced on October 15, the letting of contracts for 95 miles of cement road, under the bids received.

Bids for 13 miles were rejected, and bids for 79 miles were left for further consideration. The bids rejected were for stretches of road on which the bidders failed to get below the maximum of $30,000 which the governor fixed when, in February, he held up road contract letting on account of the high prices then prevailing.

The lettings were for cement pavements, 18 feet in width and total cost is $2,597,769 or $27,359.35 a mile.

Tamping sticks for charging and tamping blast holes with explosives should be made from long pieces of lumber, especially for deep blast holes. In the country it is generally possible to get some long saplings and trim them down to the proper size, but if the stick is more than 30 feet long it is generally necessary to make them of several pieces. Then the pieces must be coupled together without exposing any metal on the surface. This can be done by a long splice, cutting the stick to make the splice about a foot long and using screws, countersinking the heads. Over the heads putty can be put, and the stick at the splice can be painted, thus helping to hold the putty in place. Before putting the putty in the hole, paint the screw head and hole.

Nothing but explosives should be stored in an explosives magazine, and preferably but a single class of explosives; for explosives of different classes may affect one another unfavorably when stored together. Detonators, caps, fuse and all other mediums of ignition or detonation should be stored at a distance from explosives.

New Nelson Loader

A new piece of equipment that embodies some valuable features of simplicity and compactness is the Nelson Wagon Loader recently put on the market by the N. P. Nelson Iron Works of 212 South Fortieth street, Brooklyn, N. Y.

The Nelson Loader is the old reliable scraper-flight conveyor set upon wheels. The adoption of that principle undoubtedly makes for lightness and for convenience in handling, and Nelson design has imparted to this device a number of advantages over and above those inherent in loaders of the scraper-flight class.

The method, for example, of handling a stone which may become lodged under one of the scraper flights illustrates well the capacity of the machine to meet the varying and uncertain conditions that surround the work of handling material. No matter how odd the shapes in the lump material may be, the flared entrance to the trough prevents resistance at this critical point, and another precaution taken by the designer starts the stone on its smooth journey up the conveyors. In usual scraper-flight designs, the lower idler roller has its shaft resting in two bearings. The inevitable results of the coming of a large stone to such a fixed roller would be a bent flight plate, a bent idler chain, a broken chain, and a stalled motor. On the Nelson Loader such an accident is overcome by two plates on the sides, at the foot of the trough, which permit the idler shaft to rise and fall in slots cut in these plates. Hence when lumps are being handled with the Nelson Loader the idler roller rises and permits the flight plate, with

out the slightest strain, to continue upward, pushing the stone ahead of it.

This loader operates well on uneven ground, and at any angle. It can reach more material from one position than any similar device so far developed. This last feature is valuable, for it makes possible the loading of a truck wihout moving the truck to correspond with a new position of the loader. Thus the loader can be operated by the driver or chauffer who does not have to think about moving his truck around.

The 30-ton-per-hour Loader is designed to be moved about by one man, while the 60 and 90-ton types move about under their own power on wide-tired wheels with the traction cleats, or on crawler treads.

The machine is shipped in one complete unit, ready to work when raised by the turnbuckle hand wheel. It may be equipped at the factory with any practical hopper, box, screen chute, dust chute or swivel spout to meet the needs of each individual condition.

Getting Together

"ASSOCIATIONS are founded on honor and the Golden Rule," said Secretary Pierce of the Illinois Concrete Aggregate Association before the October meeting of the Wisconsin Mineral Aggregate Association at Milwaukee.

Mr. Pierce has been a close student of organized trade activities and is well fitted to tell how such associations function and the benefits that come from them. Here are a few helpful sentences from his Milwaukee address:

"Old grudges, personal animosities, disputes, suspicion—these are the enemies of co-operation; and do you think these enemies can be dispelled instantly or that co-operation can be good while they exist? No; confidence comes gradually and always as a result of closer acquaintance. Everywhere in Association work there are cases where competitors have entirely changed their views of each other after closer acquaintance. Everyone of you have done it. You have found that some man does not have horns and cloven feet and that there is no need to cross the street to avoid meeting him. You have sat down across from him at the same table; you have seen that he can smile; that he is almost human. You begin to find it harder to play a trick on him or treat him unfairly. And the interesting part of it all is that he formerly thought just as badly of you and is also changing his mind.

"When we differ from someone we do not know, we usually form an unfavorable opinion of him; but when two people sit down quietly and discuss their differences, they find they have much in common and that there is something on the other side they did not know. We are usually accorded the same treatment we give. Confidence begets confidence, fair dealing prompts fair dealing, frankness induces frankness. If a man is suspicious of his competitors, they will be suspicious of him. If he is not frank and open with them, they will be less so with him.

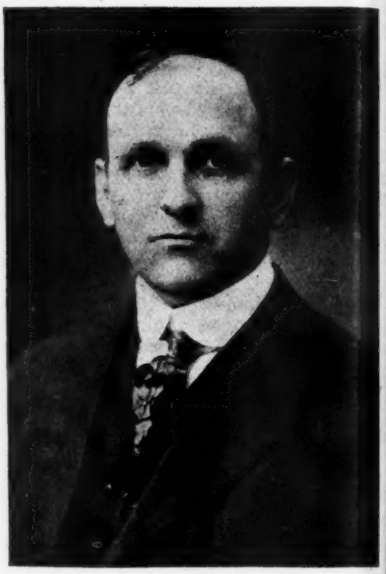
"Every industry has it leaders and its camp followers. No Association ever had 100 per cent co-operation at the start. The lessons and precepts of co-operation must be repeated again and again. The schooling has just begun when a man joins the Association."

Truck haul tonnage from quarry plants is increasing. At a recent mid-west quarrymen's conference this fact developed: That in 1921 trucks had hauled 35 per cent of the plant output. This was an increase from 5 per cent in 1916 to 35 per cent in 1921. Excessive freight rates were given as one of the causes. Uncertain car service a second cause. Cheaper delivery at point of use or distribution a third cause. Quicker delivery a fourth cause.

The Johnson Sand, Gravel & Supply Company, Cleveland, Ohio, has been organized with a capital of $40,000, by Mr. Frank Johnson.

New Lime Executive

National Association Secures Peter C. Spence for Construction Department



Peter C. Spence

MR. PETER C. SPENCE, who has been made manager of the Construction Department of the National Lime Association, is a native of New York City and has spent the greater part of his business life in that section of the country. He is well along in the forties, a graduate of New York University in science and civil engineering, and also qualified as a mechanical engineer. In his earlier life, he was for five years an inspector and engineer in the Dock and Building Departments of his home city. Later, he was an assistant engineer in the construction of the subway of the rapid transit system. For five years he was engaged with a steel and iron company in the construction of skeleton steel buildings. Succeeding that period he was for six years engaged in business as a consulting engineer and contractor, dealing particularly with structural steel and reinforced concrete buildings and iron work. During this period, he was president of the Consolidated Iron League involving 115 members, and vice-president of the Consolidated Building Trades Credit Association.

Since 1914 he has been engineer and expert in building construction, ventilation and accident prevention in the New York State Department of Labor, with particular reference to New York City. In this capacity, he has had supervision of accident prevention work that has involved extended lecture tours, dealing with the principles and practice of accident prevention, and he has contributed to journals on the same subjects. His work for many years has brought him into particularly close touch with laws and codes relating to building work. He has a very wide acquaintance among officials in the building field and with contractors and practical builders. In his new capacity he will have supervision of the co-operative investigation of lime in construction uses, such as its effect on concrete, its fire resistance in plaster, the composition of lime plaster for special uses, acoustic properties of lime plaster and other properties being conducted by the United States Bureau of Standards and with several other laboratories by the Association. Lime needs much special study to adapt its properties to the numerous new problems in building operations which have arisen in recent years by the introduction of concrete, hollow tile, metal lath, machine mixers, automobile transportation of mortars, and many other developments in building construction. His varied experience, training, and attractive personality should adapt him very well to the new work which he is undertaking.

Cleveland Exposition

Building Show Will Open New Auditorium in January

CLEVELAND will offer something new in the way of a building exposition opening the new $5,000,000 municipal auditorium January 4 to 14, inclusive. It is sponsored by the Builders Exchange, the largest organization of the kind in the United States, and will be on a non-profit basis. Earnings are to be rebated to the exhibitors, pro rata, according to the space they bought.

Nearly six years ago Cleveland material men put on what was up to that time the most successful exclusive building material and equipment show the country had ever seen. The rebate idea was introduced at that time. Now she is blazing a new path by staging the American Building Exposition where none but the exhibitors divide the profits, and the popularity of the idea is being reflected already in the tremendous space sales.

There are two floors in the new auditorium, one the convention hall proper, the other the main exhibition floor, and both will be used.

Exterior structural materials, real estate, financing and architecture will dominate the convention or arena floor. Here will be built a dozen completed cottages and bungalows, a sixty-foot ceiling height permitting. On the main exhibition floor will be shown everything that goes inside the building, decorating, finishing, furnishing and equipment, while a section will be set aside for contractors' machinery and equipment.

Adding to the national interest the Associated General Contractors have decided to hold their annual convention in Cleveland during exposition week, as also have the National Federation of Construction Industries, while the annual convention of the Ohio Association of Builders Exchange is scheduled for the last three days. Effort is being made to increase the convention list.

Macadam Specification

Steps Take to Introduce a Standard Code in Ohio.

AT THE October meeting of the Ohio Macadam Association, members were a unit in believing the association should invite the assistance of leading engineers to prepare macadam specifications which the association can recommend as a guide for construction of macadam roads in Ohio.

Mr. Allen Patterson, of Lima, moved and Mr. W. D. Robinson of Toledo supported a motion that the secretary of this association take steps to secure the services of competent engineers to recommend specifications for macadam roads which this association can offer to county and state road officials as a guide in constructing macadam roads.

Discussion was also had in reference to truck haul and rail haul of crushed stone. Figures submitted indicated rapid increase in the volume of truck haul from quarries. Complaints were reported that truck haul was ruining roads.

The Indiana Quarries Co., Oolitic, near Bedford, Ind., is reported to be planning for the rebuilding of the portion of its plant, recently destroyed by fire with loss estimated at about $20,000.

The Caruthers Sand Co., Caruthersville, Mo., has been acquired by the East Arkansas Lumber Co. The new owner will continue the operation of the property.

Sutton Files Appeal

Sand and Gravel Association Retains Attorneys to Push Campaign for Lower Rates

By Our Washington Correspondent

THE National Association of Sand and Gravel Producers has filed with the Interstate Commerce Commission, through its executive secretary, E. Guy Sutton, an appeal seeking an immediate "investigation into and concerning the propriety and reasonableness of the present basis and level of freight rates, and of the specific rates themselves, applying on carload movements of sand, gravel, and crushed stone over the lines of defendants, from each and every shipping point in the States of Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi and Louisiana to each and every destination in all of said States. The complaint is not limited to interstate traffic, but in the respects hereinafter set out covers also intrastate rates and traffic in said commodities within the States named."

The brief just filed covers only the Southern section of the country, but briefs covering every section will be filed later. The association has retained John S. Burchmore and Luther M. Walters, of the Chicago law firm of Borders, Walters, Burchmore & Collin, to handle the legal phases of the case. All briefs filed with the Interstate Commerce Commission will, however, be prepared at the association's headquarters here under the direction of Mr. Sutton.

After explaining that sand, gravel and crushed stone are important basic commodities used extensively in construction work of all kinds and in the building and maintenance of highways, the brief continues:

"The present freight rates applied by defendants on sand, gravel, and crushed stone throughout the territory described, are a severe menace to the complaining shippers and producers of these materials in that such rates are causing and have caused a more extended use of local materials delivered from local pits or plants by truck or wagon. The rates have resulted in eliminating important markets and restricting the movement by rail from plants equipped for efficient production of standard materials and have caused a lowering in the standards of specifications for sand and gravel used in concrete work. Under the present rates, a large tonnage of sand, gravel, and crushed stone has been diverted from the railroads to transportation by river, by motor truck and by wagons; the business of the industry has been disorganized; production has been curtailed; and an inactivity in construction work in general has been caused. The complaining shippers are threatened with great financial loss, and in many cases with ruin, if the present level of rates is continued, as they will be unable to operate their plants in the restricted markets, to which they will be confined if relief is not afforded.

"From the broad standpoint of public policy, these complainants earnestly submit that the Interstate Commerce Commission as responsible agent of the Federal Government charged with administration of the Transportation laws, should take prompt action to reduce transportation rates on basic building materials to a basis that will enable resumption of construction work throughout the country. The plainest and quickest remedy for the present general condition of unemployment throughout the southern States, as throughout the United States, would be afforded by encouraging the immediate building of houses, highways, viaducts, bridges, and structures of all kinds.

"The premises considered, the association above named, and complaining shippers, respectfully aver that the present rates published, maintained and charged by the defendants, individually and jointly for each and every movement of sand, gravel and crushed stone, in carloads, from each shipping point reached by any and all defendants in all of the States named in paragraph III to every destination reached by any defendant in all of said States, are,

"(a) unjust and unreasonable in violation of Section I of the Interstate Commerce Act;

"(b) unduly prejudicial and discriminatory as compared with rates on other commodities in the same territory, in violation of section 3 of said Act; and

"(c) in violation of Section 15a of said Act, in that the said rates instead of producing the maximum revenue on said traffic in order that defendants may in the aggregate and individually earn the rate of return contemplated by said section, are so adjusted that by curtailing the traffic and driving tonnage away from respondents, their aggregate revenues are unduly and unnecessarily diminished."

In conclusion, the brief says:

"Wherefore, your petitioners pray that the Commission will file this complaint and serve the same upon each of the defendants with notice to satisfy the same and to present their answers thereto; that the matter be set down for hearing as promptly as possible at points convenient to the parties and to the Commission, and that a full and expedited hearing and investigation by the Commission may thereupon be had; that the Commission after such hearing will issue its order requiring the defendants individually and collectively to cease and desist from the aforesaid violations of law, prescribing just and reasonable rates and rate basis for the transportation, as aforesaid, of sand, gravel, and crushed stone in the territory aforesaid; that the Commission will further set aside or modify the order heretofore entered in the proceeding known as Ex Parte 74 insofar as the same required, or was construed to require, increases of rates on sand, gravel, and crushed stone, interstate and intrastate; and that the Commission will enter such other or further order of orders and take such steps as may be found necessary or reasonable in the premises."

Between 300,000 and 350,000 men will be given employment by the adoption of the conference report on the so-called good roads-bill, according to the Department of Agriculture. The report, providing for the appropriation of $75,000,000 to be distributed among States in accordance with the Federal aid roads act, is now pending in Congress. Its adoption is expected within a few weeks. As agreed upon by the conferees, the $75,000,000 shall be distributed to provide $25,000,000 to the States for road construction immediately upon enactment of the measure and $50,000,000 six months later. In addition, $5,000,000 is to be immediately available for national forest roads and $10,000,000 more on July 1, 1922.

"Thirteen States have reported to the department that their highway work is being delayed because they have exhausted previous allotments of Federal aid," the department states, "or that they are holding work planned in anticipation of the new appropriation. Other States are preparing enlarged programs of road construction. In virtually all cases, these are the more populous States which receive large allotments and already have taken the legislative action necessary to meet the requirements of the Federal highway measure."

Home Building Record

New York Many Millions Ahead of Other Years—Eastern News Notes

By Our Eastern Correspondent

DESPITE the customary seasonal slacking in trade at this time of year in the sand, gravel, crushed stone and affiliated industries, the demand is keeping up well in the New York district in certain branches of the business. Building operations are responsible for large and continuous distribution, devoted for the most part to apartment and dwelling construction. In this latter direction, the metropolis is breaking all previous records, and for the first eight months of the present year, the aggregate in all five boroughs has reached $262,614,000, or more than $24,000,000 in excess of the entire year of 1920.

Road work in the upper part of the state continues at a good pace, and sizeable quantities of cement, crushed stone, gravel, etc., are being absorbed for highway improvements. The indications are for full activity in this line well into the winter season, and producers are encouraged by the situation.

Prices of materials in the sand, gravel and stone industry are showing a downward trend, and the past month has produced a number of changes. Now that the decline has started, it is not unlikely that further drops will be recorded as the winter season comes in. The lower quotations, however, are meeting the favor of dealers and consumers, and are the result of the natural downward pressure which has been exerted to bring all building materials to lower levels in recent months. Incidentally, it is interested to note, that other products, unexpectedly, are exhibiting similar inclination to recede

Gravel in the wholesale market at New York has recorded a decline of about 25 cents a cubic yard, and present figures stand at $2.00 for 1½ and ¾-inch stocks. Just a year ago, $3.00 was the popular quotation for this material locally. Sand is holding its own, with a price of $1.25 a cubic yard in cargo lots, wholesale. Dealers are retailing gravel at $4.00 and $4.05 a cubic yard, and sand at $1.80 and $1.90, delivered on the job. High grade white sand shows no change from a $5.00, retail level.

Crushed stone shows a fractional decline in the wholesale district of 10 cents a cubic yard, with present figures varying from $1.80 to $1.90, both for 1½ and ¾-inch material. Dealers have not, as yet, to any extent dropped in their quotations for delivered stocks, and the $4.00 price, heretofore prevailing, is being fairly well maintained. Grit is being retailed at $3.50 a cubic yard.

Portland cement has experienced a decline of 10 cents a barrel during the month, changaing the $3.00 retail figures to $2.90, delivered. The bag rebate holds at 10 cents. In the wholesale market, the price to dealers, alongside dock, is $2.10, and delivered, $2.50. Hydrate finishing lime has dropped to $17.00 a ton at the warehouse, while common lump lime, warehouse price to dealers, is $3.70 for a 280-pound barrel. Hydrate finishing lime in paper is being retailer in this district at $24.00 a ton, while common hydrate in cloth, delivered, is $22.50 a ton.

The Terry Limestone Corporation, Athens, N. Y., has been formed under state laws, with capital of $20,000, to operate local properties. The company is headed by I. B. and W. C. Terry, and C. H. Davis, Athens. It is represented by Stoddard & Mark, 120 Broadway, New York.

F. Onorato, Inc., Brooklyn, N. Y., has been incorporated with a capital

of $5,000, to operate a stone quarry. The company is headed by A. G. D'Antonio, and F. Onorato, Brooklyn. it is represented by J. V. Grilli, 27 Cedar Street, New York.

The Ralph Gypsum Co., Le Roy, N. Y., operating properties in this section, Stafford and vicinity, recently held its annual meeting, electing George J. Ralph, Akron, N. Y., president; George W. Miller, South Byron, N. Y., vice-president; Edward H. Hunt, Le Roy, secretary; and Joseph Voegele, Lancaster, N. Y., treasurer.

The Connecticut Pink Quarries, Inc., Main Street, Niantic, Conn., has been organized to operate stone quarries in this section. O. W. Salmi is president and J. A. Hanninen, treasurer, both of East Lyme, Conn.

Sand producers in Dover, N. J., are maintaining active production, with prospects for continuing as long as weather conditions are favorable. The Succasuna Sand Co. is operating at capacity and large shipments are leaving the properties. Ridner Brothers, with sand pits at Kenvil, near Dover, are engaging under good output and have arranged for electric power supply for operation from the local central station. The connected load at the plant will run over 100 horsepower, with prospects of increase in the near future.

The Schaffer & Ryer Co., Northampton, Pa., is working on a day and night basis at its stone quarries, with adoption of the night-shift quite recently. The plant is being operated at capacity and large shipments of crushed stone are being made.

The Waynesboro Hydraulic Stone Co., Waynesboro, Pa., has filed notice of dissolution under state laws.

The Chico Co., Philadelphia, Pa., has been organized under Delaware laws with capital of $100,000, to operate quarry properties. The company is headed by Frederic J. Chico, and is represented by the Colonial Charter Co., Ford Building, Wilmington, Del.

The Industrial Limestone Co., Allentown, Pa., has secured a contract from the city of Easton, Pa., for furnishing lime for the municipal disposal plant. Shipments will be made from the company's plant at Phillipsburg, N. J., just across the Delaware River, under a contract price of $10.00 per ton, f. o.b., that point.

The Union Stone Co., New Holland near Mount Wolf, Pa., has announced a reduction of 20 per cent in the wage scale of laborers at the plant, effective at once, totaling about 20 cents an hour.

The Columbia Sand Works, with plant near Huntingdon, Pa., operated by the Pennsylvania Glass Sand Co., Lewistown, Pa., has resumed operations after a shut-down dating from the first of the year. The plant will give employment to about 75 men. The company has also resumed production at its plant at Mapleton, following an idle period of several months. The plants have been equipped with modern crushing machinery for handling sandstone. The Water Street Traprock Co., Huntingdon, is maintaining active operations at its local quarry.

There is no noticable let-up in sand and gravel production in the Pittsburgh, Pa., district, and good shipments are being made from the diggers of the different large companies operating along the Monongahela River. Gravel holds at $1.60 a cubic yard for barge deliveries, with dealers asking $2.00 and upwards, according to length of haul to the job. Sand is being sold at close to the same figures, and crushed stone at $5.00-$5.50 level.

The Keystone Sand Co. is active at Coraopolis, Pa., and the towboat "Victory" of this company has been bringing in many loads of sand for Pittsburgh distribution.

Labor Troubles Settled

Texas Now Going Ahead on Extensive Building Program

By Our Dallas Correspondent

Demand for sand and gravel in Dallas and other Texas cities continues strong and prices remain firm. Building operations show an increase and road work is also under way on a large scale. Much street paving is also being done and several large contracts are soon to be awarded.

Labor troubles in Dallas, which halted building operations on several of the larger buildings in the city, including the 32-story Magnolia Building, the North Dallas High School and several other large contracts, have been settled satisfactorily to all parties and work on these buildings has been resumed. The unsettled condition in the labor market also had tended to hold in check several large building contracts, and bids are now being asked and contracts will be awarded soon for buildings in Dallas to represent an outlay of more than two million dollars.

The street work in Dallas also is to be undertaken on a larger scale. The voters of the city at an election recently approved a bond issue of $1,250,000 for street improvement, and this sum will make possible an extensive paving program. Plans and specifications for a number of streets to be paved are now being prepared by the City Engineer's office, and bids will be asked and contracts awarded within the next three months. The bonds will be sold, making the proceeds of the issue available for payment of this street improvement, as soon as the bonds can be approved and printed.

Under the system of paving in Dallas this $1,250,000 bond issue will make possible an extensive paving program, as the property owners pay for the paving in front of their property, leaving only the street intersections for the city to pay for. Plans and specifications are now being prepared covering the paving of something like thirty miles of streets, and it is likely that more than this can be done with the proceeds of the bond issue.

Contract is to be awarded in the near future for the hospital to be built in Oak Cliff by the Methodist Episcopal Church, South, at a cost of about $1,500,000. The Rev. J. A. Old has been appointed superintendent of the hospital and he is now at work on preliminaries to the awarding of the contract.

Dallas County road work is going ahead, and the county commissioners have recently voted to issue another installment of $2,500,000 of the $6,500,000 bond issue voted about a year ago for highway construction. Work is now under way on the Dallas-Garland road, which will be of concrete 18-feet wide for a distance of a little more than 18 miles. Several other cardinal highways radiating from Dallas, in the center of the county, to the various corners and running, east, west, south and north from the city are to be built of concrete, and then a road circling the county near the county line and connecting all the cardinal highways is to be built of gravel. Specifications for this gravel road are being prepared and contracts covering its construction will be awarded before long. In the meantime work on several of the concrete highways, including the Garland road to the east and the Miller's Ferry road to the south and the Denton road to the north-west is going forward.

The county is furnishing the material for the road construction under contract on several of the road projects and on others the contractors are furnishing the sand, gravel and cement. The county is buying some of the gravel furnished, and some is be-

ing taken from the county's gravel pits.

Gravel dealers report improvement in the transportation system. Sufficient cars are available for delivery of gravel orders promptly. The greatest drawback in the gravel business, from a transportation standpoint, is the high freight rates, dealers assert.

Sand is being delivered in Dallas by motor truck at prices ranging from $2.00 to $3.50 a cubic yard, depending on the haulage. Sand is being sold f. o. b. cars at $1.50 a cubic yard. Gravel prices are somewhat lower.

Road Work to Continue

More Contracts Let and in Prospect for Kentucky Highways

By Our Louisville Correspondent

THE happenings in highway construction and prospective work of this kind in the future continue to be a feature of the news matter in this territory in the crushed stone and sand and gravel trade. There are two phases of this now; contracts recently let and the work at present under way, and the prospects for future work.

At the end of September quite a bunch of new road contracts were let, enough to run up close to a million dollars, by the State Highway Commission at Frankfort.

With contracts that had already been let and the recent letting at Frankfort there seemingly is plenty of road work in sight to keep everybody busy throughout the winter months whenever the weather is such as to permit this class of work. Meantime there are big plans under way for the future. There is a drive on for a 50 million bond issue in the state to provide money for constructing 4,000 miles of highways in Kentucky during the next 5 years. This big bond issue is being advocated by the Kentucky Good Roads Association on a plan which it is said will retire the issue within 30 years without any increase in the present tax levy for road purposes. It is hoped to get this idea through the next legislature in the form of specific action which can be voted on at the November 1922 election.

Meantime there comes out of Washington a report that 12 Kentucky road projects calling for the expenditure of $2,828,794 have been approved by the Public Roads Bureau.

Between taking care of the current demand and laying up stocks for the winter months when river operations will not be practical the local sand and gravel people are having fairly busy days. One does not get an idea of unemployment from visiting around sand and gravel people these days.

There has been quite a lively time in local building during the fall. Louisville showing up, in fact, better than most other cities with its late summer and fall building. And meantime there has been also a goodly volume of street improvement work, so taking it all together the sand and gravel people have no cause for complaint.

Mr. James Duffy, of the Ohio River Sand Company, says that they have now come to the end of the busy season in building and as a consequence things are quieting down a little. They are well stocked up in their yard here to take care of the winter trade and still have stock to start off the spring building. He thinks too from the present outlook that there will be busy doings early in the spring.

J. E. Lloyd, of the E. T. Slider Co., says they have been fairly busy with current business lately and have not yet gotten stocked up heavily but are turning their attention now to the stocking up for the winter's needs. They now hav their new unloading digger in place at the Louisville yard and working. It is performing its duty nobly too and they feel that they are now splendidly equipped.

In the Lehigh Cement District

The usual fall lull in cement production in the Lehigh Valley district of Pennsylvania is commencing to take place, but only so far of rather spotted character. The mills, for the most part, and particularly the larger ones, are continuing manufacture at a capacity to permit the storing of reserves for the months to come.

The recent decline in price has had no material effect upon operation, save for the fact that a number of producers have lowered the wage scale for common labor. The reduction of 25 cents a barrel in quotations, makes a total decline of 75 cents in the mill base from the highest figures of last year.

Coplay plants are showing the first signs of retrenchment. The Coplay Cement Co. is arranging for the early closing of its Mill B, and will concentrate operations at its Mill C, in the Coplay section. The company has been laying aside for reserves and storehouses at the plants are now fairly well filled. Large quantities of cement have been shipped for state road construction and the drawing to a close of this work is responsible, primarily, for the curtailment. The mill has reduced the wages of laborers 5 cents an hour, bringing the scale for common labor down to a basis of 25 cents an hour.

The Atlas Portland Cement Co. is continuing production at a good rate at its large mills at Northampton, and no announcement of any change has at yet been made. The Whitehall Portland Cement Co. at Cementon has been adding to its working force and manufacture is going forward under large capacity at this mill. The mills in this latter district are maintaining the large tonnage shipments which have been prevailing for some weeks past, and the bulk of output is being absorbed as soon as ready for distribution. There is not much reserve stock on hand, and the prospects are for late fall production for storing materials.

Two large barns of the Lehigh Portland Cement Co., near Mill D, at Ormrod, were destroyed by fire on October 6, with loss approximating $10,000. Considerable farming equipment was destroyed.

The protest of different cement mills in this section against the prevailing charges for power by the Pennsylvania Power & Light Co., referred to in the last issue of PIT AND QUARRY, is being extended to include practically all the plants served by the company. The latest protests to be filed are those of the Penn Allen Cement Co., Allentown, with claim of $55,030.59 for excess charges, and the Nazareth Cement Co., asking $114,000, as reparation.

The Atlas Engineering Society, composed of the heads of the mechanical departments of the Atlas Portland Cement Co., held the first meeting of its fall and winter sessions on October 10, at the Chamber of Commerce, Allentown. C. A. Wallerstead, president, presided. The principal address was made by J. Byame of the Atlas mill, on the subject of "Belt Conveyors."

The Vulcanite Portland Cement Co., Alpha, N. J., has recently reduced the wages of employes 20 per cent, at the same time changing the scale for laborers from 25 to 27½ cents an hour. About 400 operatives are effected. The company is operating under good production at its local mill.

A New Hardinge Booklet

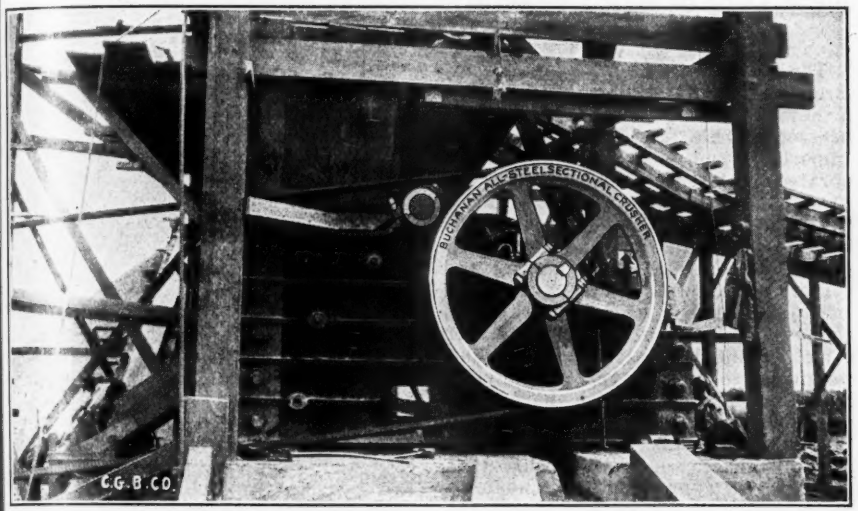
A bulletin entitled "Pulverized Fuels" has just been published by the Hardinge Company. This bulletin is known as their Catalogue No. 9.

The adoption of the Hardinge Mill for pulverized fuels is comparatively recent, according to their own statement, which follows:

"The Hardinge Conical Mill, although only recently applied to this field, has been fully demonstrated as a most satisfactory unit for pulverizing solid fuels. The results obtained are a continuation of the remarkable record of the Hardinge Mill in the mining and industrial grinding fields, as evidenced by the fact that over $70,000,000 tons of friable materials are being ground per year in Hardinge Mills alone."

This Bulletin is divided into three main sections, viz., the application of pulverized fuel to various burning problems, the principle of operation of the Hardinge Mill, and a discussion of the application of the Hardinge System for pulverizing fuels.

In the general discussion of pulverized fuel where the Hardinge Sys-



tem is used, emphasis is laid on the point that when coarse oversize of from 65 to 150 mesh, depending upon the character of fuel, is eliminated, "sparking" ceases, and when this oversize is eliminated by a satisfactory means, it is not necessary to grind to a degree of fineness which was at one time thought necessary.

Under the subject "The Hardinge Mill," the general principle of grinding is discussed, with special reference to stage reduction, elimination of the fine particles as soon as produced, and the proportioning of energy to the work required. The different types of Hardinge Mills and the details of their construction are also discussed in this section, and special reference is made of the advantages of the conical mill when used for pulverized fuels of widely different character.

Under "Pulverized Fuel Installations," a complete pulverized fuel plant is outlined, which includes the feeding of the coal from the track hopper to the crushers, dryer, mill, separator, and distribution system. There is also taken up different arrangements of the mill and separator which would be used according to the special requirements. In addition, there is given a table showing the general dimensions of the different sizes of Hardinge Mills, so that it is possible to make a rough estimate of the floor space required for each unit.

Buchanan Jaw Crusher in Texas Quarry

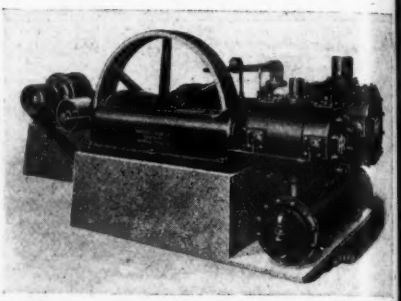
At the quarry of the Texas Trap Rock Company in Knippa, Texas, the work of reducing the stone to size is done by a 40x42 inch special all steel Buchanan jaw crusher. This device has a capacity of 200 tons of rock per hour. The flow of rock to the crusher is controlled by a gate operated by a hoist which is also used for hauling the cars.

Opens Buffalo Office

Chain Belt Company, Milwaukee, Wis., has opened offices at 735 Ellicott Square, Buffalo, N. Y., and announces the appointment of T. E. Cocker as District manager of that territory. Mr. Cocker will handle the Rex line, including chain, sprocket wheels, rex traveling water screens, elevators and conveyors.

For the past five years Mr. Cocker has been handling elevating and conveying equipment. He is a graduate of the Rensselaer Polytechnic Institute at Troy, N. Y., class of 1907 Civil Engineering. From 1907 to 1917 he was connected with the New York Central Railroad at Buffalo, and at the time he left this company was assistant engineer.

New Type of Belt Driven Air Compressors



The Ingersoll-Rand Company, 11 Broadway, New York, has announced a new line of belt driven air compressors. This type is known as the Imperial Type XCB and has incorporated in it several noteworthy features of construction, including Ingersoll-Rand plate valves, for both air intake and discharge, and the 5-step clearance control for regulating the compressor's output.

The plate valves used in this type of compressor have been perfected after a most complete analysis of the lightweight plate type of valve. They include the features which have been proven necessary to the successful functioning of this type of valve, the most important of these being, that the valve is supported throughout its entire operation in perfect alignment without any form of wearing guide—a very essential feature in the life of the valve.

The clearance control has been used with great success on the larger direct-connected electric motor driven compressors manufactured by the same company and has proven itself to be the most satisfactory and efficient form of compressor regulation. Thousands of these direct-connected air compressors are installed in all parts of the world and are well-known by those in charge of plants where conditions call for more than 600 cubic feet of free air per minute and where direct-connected electric motor drive is used. The use of this form of regulation is a most noteworthy development in air compressor design during recent years and should be of interest to all users of air power.

The clearance control is a method of securing extremely efficient operation at partial loads. Under average working conditions it is well-known fact that the demand for air is seldom steady throughout the working day and for this reason the performance of the compressor at underload is of primary importance.

With the clearance control the compressor is automatically loaded or unload in five successive steps, these steps being obtained by the reduction or addition of clearance space to the air cylinders. The compressor will operate at full, ¾, ½, ¼ and no loads and the design of the clearance control is such as to secure efficient operation at any one step the reduction in input power required being practically in proportion to the reduction in output capacity.

The entire control is automatic. If the compressor is operating at full load and the demand for air falls off this control automatically causes the compressor to operate at one of the underload points. When the demand for air is increased the compressor automatically assumes the load in successive steps.

Another added feature of this control is the maximum demand stop which will prevent the compressor being operated at any higher maximum load than is desired.

With the clearance control, reduction in power required will be in proportion to reduction in output capacity. All the mechanism for regulating the compressor is independent of the compressor running gear. The loading and unloading of the compressor is automatically accomplished in steps, the difference between any two steps being small enough to prevent any undue electric current fluctuation.

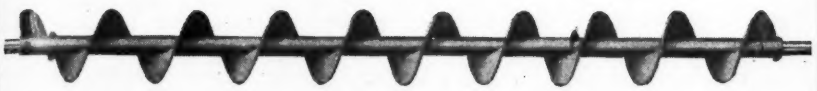
The Ingersoll-Rand Company also announce their new Bulletin No. 3042 in which this new type is described in detail.

The Roanoke Washed Sand Co., Roanoke, Va., has been organized with a capital of $50,000, to operate sand properties in this section. W. W. Coxe is president, and Jesse Cook, secretary.

The Williamson & Lawson Company, Inc., of Springfield, Mass., has been incorporated with a capital stock of $25,000, to produce sand and gravel. The incorporators are: Harley F. Williamson, Robert E. Lawson, and James H. Mulcare.

CALDWELL

SERVICE



HALF a million dollars worth of well selected stock, constantly maintained, and an organization keyed up to the theory that plant efficiency is measured by the number of orders shipped on the day of receipt, accounts for Caldwell service.

If you need gears, sprockets, transmission machinery, Helicoid Conveyor or any of the Caldwell specialties promptly, wire Caldwell, or call up the nearest Link-Belt office. You will find Link-Belt Company offices in all principal cities.

H. W. CALDWELL & SON CO.

LINK-BELT COMPANY, OWNER

CHICAGO, 17th Street and Western Avenue

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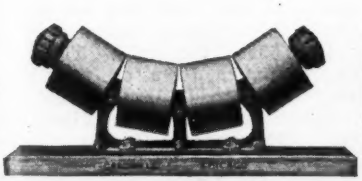
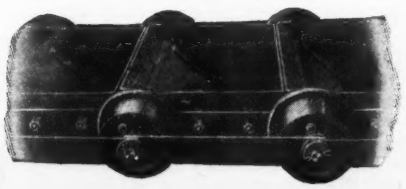




Williams Leaves Association

The Executive Committee of the Federal Highway Council at a meeting held September 23, by resolution unanimously adopted the following:

The Highway Industries Association, more recently merged into the Federal Highway Council has had the advantage of the comprehensive knowledge, the constant administrative and executive service for the purpose of the organization for the four years past of Mr. S. M. Williams.

Under his guidance the economic relationship of transportation agencies have become better understood and the service of each more justly esteemed both mutually and by the public, the highway development greatly stimulated throughout the nation; and the problems of their scientific construction in the interest of public economy, have been brought to a stage of investigation and research promising solution beyond any hope heretofore entertained, justifying the belief that the highways of the future will be built for greater and more durable service for less money.

The intimate contact brought about with commercial organizations; individuals using the highways; trade organizations interested in building them; officials supervising their construction; and the vehicular equipment for use thereupon has been such as to allay jealousy, influence efficiency and develop just consideration and equitable laws insuring benefit to public welfare.

As this service was so efficiently rendered, so thoroughly established and there is such great need for its continuance it is with the greatest regret that the Executive Committee is made aware that Mr. Williams must relinquish the work in the interest of his family and private affairs.

His time and this service has been given without compensation and the Washington Office must, therefore, be closed and the work be suspended for the present, except perhaps that which the various committees of the organization may find means of continuing.

The Executive Committee wishes to place on record their qualified testimony of the invaluable service rendered by Mr. Williams and join in the wish that means may be found by which the foundation so adequately laid may be built upon and highways of the country through state and national provisions be developed commensurate with the country's need.

Recent Patents

The following patents of interest to readers of this journal recently were issued from the United States Patent Office. Copies thereof may be obtained from R. E. Burnham, patent and trademark attorney, Continental Trust Building, Washington, D. C., at the rate of 20c each. State number of patent and name of inventor when ordering.

1,386,633. Rock-drilling machine. Robert A. W. Krampitz, Valdez, Alaska.

1,386,764. Crusher. Charles G. Buchanan, East Orange, N. J.

1,387,042. Excavating and hoisting apparatus. Theodore Carlson, Stillwater, Wash.

1,387,447. Rock-drill. Allen Alford, Waco, Tex.

1,387,485. Side-dump car. Alexander M. Gow, Duluth, Minn.

1,387,875. Excavating-machine. Adolph H. Wellensiek, Stockton, Cal.

1,387,886. Coal-mining machine. Thomas Donohoe, Edgewood, Pa.

1,387,968. Dump-car. Nels Ekberg, St. Paul, Minn.

1,388,406. Rock-drill. Omar E. Clark, Denver, Colo., assignor to Denver Rock Drill Mfg. Co., same place.

1,388,462. Grinding-mill. Harry W. Hardinge, New York, N. Y., assignor to Hardinge Co., same place.

1,388,463. Grinding-mill and grinding medium therefor. Harry W. Hardinge, New York, N. Y., assignor to Hardinge Co., same place.

1,389,076. Mining-locomotive. William W. Sloane, Chicago, Ill., assignor to Goodman Mfg. Co., same place.

1,389,231. Mechanism for screening or sifting granulated substances. Alexander Walker, Wallsend-upon-Tyne, England, assignor of one-half to Drakes Limited, Ovenden, Halifax, England.

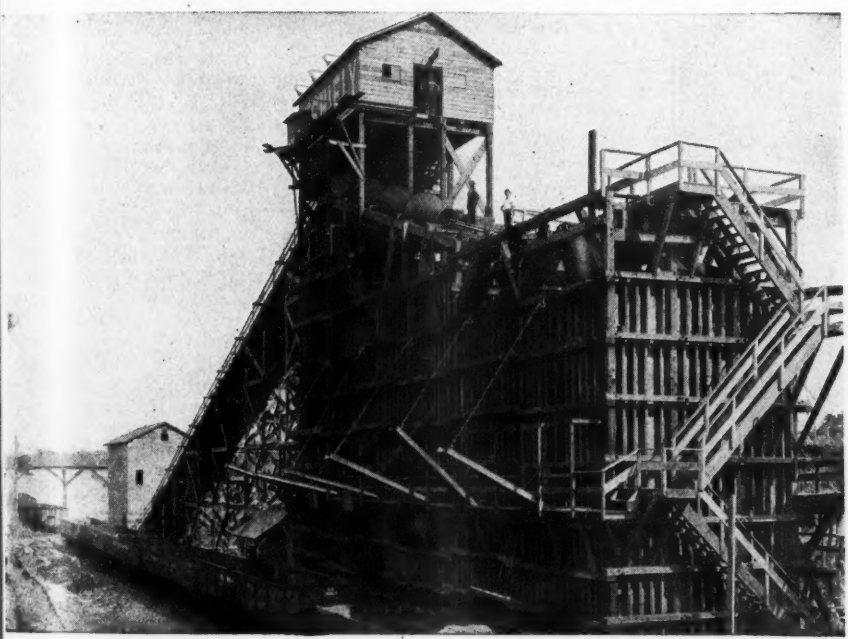
1,389,421. Power-shovel for use in mines to load coal and ore into cars. Clyde S. Corrigan, Norwood, Ohio.

1,389,539. Rock-drill. Thomas Turner, Ottumwa, Iowa, assignor to Hardsoeg Wonder Drill Co., same place.

1,389,888. Material-handling apparatus. Edward McGowan, Mulberry, Kans., and Preston Upham, Boston, Mass.; said Upham assignor to Sullivan Machinery Co., Claremont, N. H.

LINK-BELT

Sand and Gravel Plants



This Link-Belt Sand and Gravel Plant of the J. L. Shiely Co., St. Paul, Minn., is equipped with Dull Inclined Conical Screens and Conical Sand Separators. It is designed to wash and screen sand and gravel as well as a separate grading and washing of crushed boulders. It has a capacity of 3,000 tons daily, including three grades of gravel, two of sand and two of washed crushed stone.

A storage system consisting of two Link-Belt Belt Conveyors with trippers, is provided, to store any one of the seven grades of material produced, in separate piles.

Send for Catalog No. 440 "Link-Belt Plants for Washing Sand and Gravel." It shows what Link-Belt equipment has accomplished for many concerns, under a wide variety of conditions.

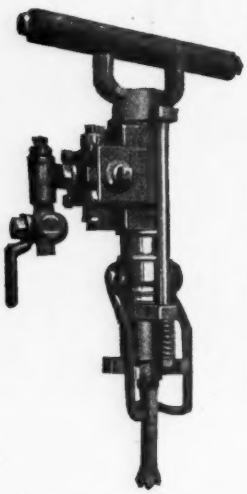
LINK-BELT COMPANY

PHILADELPHIA
Hunting Park Ave. and Pa. R. Rwy.

CHICAGO
300 W. 39th St.

New Hardsocg Hammer Drill

The new No. 3 Hardsocg hammer drill, manufactured by the Hardsocg Wonder Drill Co., of Ottumwa, Iowa, is a valve operated tool quite similar in appearance to the standard Hardsocg patterns. It uses equipment similar to other machines and is intended for use with a ¾-inch hose, with air pressure 65 to 75 pounds at the drill.



The drill is made entirely of forged material, and all wearing parts are accurately machined, hardened and ground. It is fitted with a live air valve which enables the user to send a strong pressure of air direct from the air line through the steel drill to clean deep holes or holes drilled in soft rock. An air strainer connects directly with the drill and prevents small particles of hose lining, rock, metal, or any foreign substance from entering the machine. There is a good sized lubricating chamber in the valve chest. In addition to this, lubricants can be put into the strainer by removing the strainer plug.

The No. 3 Hammer Drill weighs about 45 pounds. The hose, wound with heavy half round spring wire, is furnished in 50 foot length, fitted with safety supples, safety clamps, and a special malleable coupler permits instant detachment.

Buy Northwest Engineering Works

The Northwest Engineering Company, on September 3rd purchased the plant, assets, business and bills receivable of the Northwest Engineering Works of Green Bay, Wisconsin. The Northwest Engineering Company has assumed and will pay the accounts, notes and bills payable of the Northwest Engineering Works, has taken over all contracts and will continue the manufacture of the "Northwest" crane. Accounts due to the Northwest Engineering Works will be collected by the new Company and should be paid at the home office in Green Bay.

Recent Patents

The following patents of interest to readers of this journal recently were issued from the United States Patent Office. Copies thereof may be obtained from R. E. Burnham, patent and trade-mark attorney, Continental Trust Building, Washington, D. C., at the rate of 20 cents each. State number of patent and name of inventor when ordering.

1,390,839. Crushing-mill. Thomas J. Sturtevant, Wellesley, Mass., assignor to Sturtevant Mill Co., Boston, Mass.

1,390,840. Machine for reducing and separating materials. Thomas J. Sturtevant, Wellesley, Mass., assignor to Sturtevant Mill Co., Boston, Mass.

1,391,026. Screening and concentrating device. Herbert B. Walling, Salt Lake City, Utah.

1,391,708. Pneumatic rock-drill. Clarence R. Welch, Denver, Colo.

1,391,737. Power-shovel. Charles S. Johnson, Toledo, Ohio.

1,392,069. Shoveling-machine. Henry McDermott, Iron River, Mich., assignor to McDermott Mechanical Co., Iron Mountain, Mich.

1,392,598. Mining machinery. William W. Robbins, Lorain, Ohio.

1,392,779. Sand and gravel washer. John J. McManamen, Mitchell, S. Dak., and Charles F. Smith and Alexander Munro, Milwaukee, Wis., assignors to Smith Engineering Works, Milwaukee, Wis.

1,392,835. Mining-machine truck. Nils D. Levin, Columbus, Ohio, assignor to Jeffrey Mfg. Co., same place.

1,392,836. Mining-machine truck. Nils D. Levin, Columbus, Ohio, assignor to Jeffrey Mfg. Co., same place.

1,392,887. Machine for grinding ores, mineral stones, and the like. Joseph R. Broadley, London, England.

The Mitchell Lime Company, Mitchell, Indiana, has changed its name to Lehigh Lime Company.

The large stone crushing plant of the Lyinite Trap Rock Company at Little Falls, N. Y., was burned to the ground recently.